

# A HISTORY OF MARINE FIGHTER ATTACK SQUADRON 531



HISTORY AND MUSEUMS DIVISION  
HEADQUARTERS, U.S. MARINE CORPS  
WASHINGTON, D.C.

*An F/A-18A from VMFA-531 joins two other Marine Hornets in a flight over California's majestic Mount Whitney.*  
*(Photo courtesy of VMFA-531 Archives)*

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by  
Colonel Charles J. Quilter II, USMCR (Ret)  
and  
Captain John C. Chapin, USMCR (Ret)



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# Foreword

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This history traces a half century of active service by Marine Fighter Attack Squadron 531. It was a unique squadron because its history demonstrates the complete evolution from night fighter to all-weather fighter to fighter-attack. Its earliest days placed the Marine Corps as the pioneer of all the military Services in night fighting.

From the primitive converted civilian airliner, the PV-1, to the most modern Marine Corps fighter, the F/A-18, the "Grey Ghosts" evolved as their tactics changed. Their service covered the globe: Cherry Point on the East Coast, Texas, El Toro on the West Coast, the Southwest Pacific, Iwakuni in Japan, Cubi Point in the Philippines, Korea, Vietnam, the Indian Ocean, and the Caribbean.

Colonel Charles J. Quilter II provided a large majority of the text. He retired from the Marine Corps Reserve in 1994 after 34 years of service. He studied in Japan and graduated from the University of California, Berkeley, with a degree in East Asian History. Commissioned in June 1964, he gained his aviator wings in November 1965.

He then joined Marine Fighter Attack Squadron 531 (VMFA-531) at Cherry Point, North Carolina, as an F4-B Phantom pilot and deployed to Puerto Rico at the end of the Dominican Republic crisis in 1966. He flew 252 combat missions with VMFA-323 from Chu Lai, Vietnam, in 1967-68 serving as a flight commander. He did a second tour with the "Grey Ghosts" of VMFA-531 as its operations officer at El Toro, California, in 1968-70, where he was also designated as one of the Marine Corps' first dissimilar air combat training instructors, flying as an adversary pilot in A-4 aircraft.

His assignments in the Reserve included command of VMFA-134 at El Toro in 1984-86 and Mobilization Training Unit (History) DC-7 in 1989-93 at the Marine Corps Historical Center in Washington, D.C. In 1990, he led a detachment to Southwest Asia during the Persian Gulf Conflict of 1990-91, and served as Command Historian of the I Marine Expeditionary Force in charge of the Corps' historical collection effort. He was coincidentally the senior Marine reservist present at the liberation of Kuwait. In 1994, he served with Marine aviation units at Aviano, Italy, which were flying combat support missions for United Nations forces in Bosnia and Herzegovina. He has written a number of articles and histories about the Marine Corps. The present work was first written in draft from 1986-90.

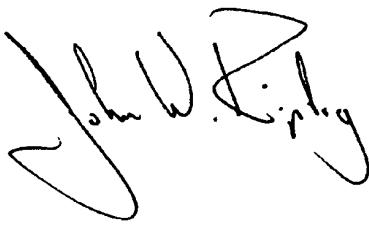
Colonel Quilter's decorations include the Legion of Merit, the Meritorious Service Medal, 17 Air Medals, the Combat Action Ribbon, and Presidential and Navy Unit Citations. In civilian life, he is a captain for Delta Airlines. Married with two children, he resides in Laguna Beach, California.

Captain John C. Chapin earned a bachelor of arts degree with honors in history from Yale University in 1942 and was commissioned later that year. He served as a rifle-platoon leader in the 24th Marines, 4th Marine Division, and was wounded in action during assault landings on Roi-Namur and Saipan during World War II.

Transferred to duty at the Historical Division, Headquarters Marine Corps, he wrote the first official histories of the 4th and 5th Marine Divisions. Moving to Reserve status at the end of war, he earned a Master's Degree in history at George Washington University with a thesis on "The Marine Occupation of Haiti, 1915-1922."

As part of the Historical Center's series of monographs commemorating the 50th anniversary of major Marine actions in World War II, and with the support of the Marine Corps Heritage Foundation, Captain Chapin researched and wrote accounts of operations in the Marshall Islands, on Saipan and Bougainville, and Marine aviation in the Philippines. Then, as part of the Historical Center's series on the 50th anniversary of the Korean War, he wrote the account of Marine operations in the Pusan Perimeter.

The History and Museums Division welcomes any comments on the narrative or additional information on VMFA-531.



J.W. RIPLEY  
Colonel, U.S. Marine Corps (Retired)  
Director of Marine Corps History and Museums

# Preface

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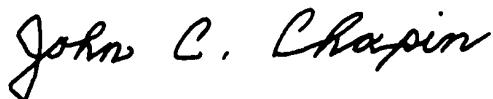
This is an operational narrative of one of the Marine Corps' most unusual aviation squadrons moving, as noted in the Foreword, through three successive and different fighter roles during 50 years of continuous service. It was a pioneer in several ways, and the superior quality of its performance was marked by numerous awards.

Information for this history was drawn from primary sources in command diaries and chronologies and from interviews, base newspapers, published historical works, and valuable information from the files and helpful personnel of the Reference Section at the Marine Corps Historical Center.

In addition, Major William Henson and First Lieutenant Wesley Johnson, two squadron "alumni" who have been active in the "Grey Ghosts," contributed information and essential photographs. We express our appreciation to all those who contributed to this history.



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Painting courtesy of Hughes Aircraft Company

*Painting by William S. Warren of the insignia and aircraft used by VMF(N), VMF(AW), and VMFA-531 down through the decades.*

# A History of Marine Fighter Attack Squadron 531

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## *Facing the Problem*

A half century of distinguished service with multiple unit awards, the pioneer of night/all-weather tactics and combat, this is the record of Marine Fighter Attack Squadron 531 (VMFA-531). While that was its final designation, it began its career as VMF(N)-531, the Marine Corps' first night fighter squadron. It scored the first Marine night victory in 1943; it had the first close contact of the F4B(N) Phantom with MiG fighter planes during the Cuban Missile Crisis of 1963; it was the first American Phantom jet fighter attack squadron in Vietnam in 1965; and it spent 102 days at sea in 1979-80 on board a carrier during the Iranian Hostage Crisis.

These operational achievements came out of a humble, bare-bones origin. In the beginning there were no planes, no pilots, no American precedents, very little recognition of the need for night fighters, and extremely primitive equipment for locating enemy planes. Thus, the squadron, when formed, had to work its way through all these problems and grapple with the development and complexities of radar—the scientific breakthrough that would enable it to find and destroy enemy targets at night or in all-weather conditions. (“Radar” was the American acronym for radio detection and ranging.) When a Marine operator in the early years peered into a screen as the radar array slowly revolved, aircraft would appear as spikes or “blips” on the screen. (Unfortunately, so would weather, terrain, shipping, etc.)

American efforts to use and then develop radar further had their genesis in the intensive British effort to create and perfect this new science. From the mid-1930s the British Royal Air Force (RAF), in conjunction with civilian scientific researchers, had concentrated on fashioning a radar that would give accurate locations of approaching enemy aircraft. This was to be a crucial tool during the air Battle of Britain.

With World War II raging in Europe, there was

concern about the preparedness of American military forces. Recognizing the need for air defense of landing forces, the Commandant of the Marine Corps, Major General Thomas Holcomb, sent Captain E. Colston Dyer to Britain in mid-1941 to learn all he could about the RAF radar system and fighter direction. The trip made painfully clear to Dyer that neither the Marine Corps nor any other U.S. Armed Service had anything like the British system of using radar to control fighter plane missions, much less the ability to deal with a night threat.

This perilous gap led to further action by the Commandant. Another officer was detailed to Britain. He was Major Frank H. Schwable, who had recently served in the Navy's Bureau of Aeronautics. Schwable was directed to:

Look into the question of night fighters . . . . In general, get all the information you can on the organization and operations of night fighting squadrons, paying particular attention to the operational routine, squadron training, gunnery, and tactical doctrine. . . . We would also like to get your opinion on single engine, single seat operations vs. other types for Marine Corps operations.<sup>1</sup>

Schwable spent the next two months at that task and was soon convinced the RAF system could meet Marine needs. The RAF used multi-engine, multi-crewed aircraft equipped with aircraft interception (AI) radar. The planes were guided into position by ground controllers using a new type of radar screen, a circular map-like display (called Plan Position Indicator or PPI) which permitted the controller to assess target information easily, and effectively direct the fighter crew. The controllers were able to determine aircraft altitude on a separate screen which also displayed “Identification Friend or Foe” (IFF) information.

Schwable, now well aware of the many prob-

lems ahead, returned home in May 1942 to become the father of Marine night fighter aviation, while Dyer fought for aircraft and personnel on the Washington front. It would be an effective combination.

*1942: Getting Started—  
Washington and Cherry Point*

Schwable and Dyer now set about building a night fighter program which did not rate a very high priority in mid-1942, even though Marine aviation was rapidly expanding its day forces as part of an overall Navy Department effort to procure and allocate 27,500 aircraft. Navy planners, however, conceded the need for night fighters, and were working to develop their own program with a modified version of the Chance Vought F4U-2 Corsair.

The Marines found themselves in March 1942 authorized for eight night fighter squadrons of 12 aircraft, each to be commissioned successively through 30 June 1945, but with the stipulation that "no aircraft units now earmarked for the various naval activities shall be diverted to meet this supplementary requirement."<sup>2</sup>

Dyer and Schwable now began to scramble to put something together in the face of this impossible edict. The Commandant was persuaded by 12 June to recommend to the Chief of Naval Operations that "the dates for the formation of the Marine Corps night fighter squadrons be advanced to the period of 1 January-30 June 1943."<sup>3</sup>

The Chief of the Navy's Bureau of Aeronautics, in his all-important endorsement of 3 July, approved of the advance commissioning of a single squadron, but refused to budge on the matter of newer aircraft, noting that the Navy's F4U-2 and the Army's purpose-built Northrop P-61—both well behind schedule—would not likely become operational until mid- and late 1943 respectively. As a substitute, he reluctantly recommended that the unit receive "six SBD-3 Dauntlesses equipped with radar and one PV-1 Ventura. . . . The SBD type planes must necessarily be a diversion from other urgent requirements."<sup>4</sup> This endorsement had been wrought from a number of conferences that Dyer and Schwable had with the Bureau, and on 25 July, the Vice Chief of Naval Operations finally approved six PV-1s with F4U-2s as an alternative.<sup>5</sup> The Lockheed Vega PV-1 was a weak second choice, but it was the only choice, and the

Ventura would emerge as the Marine Corps' first night fighter.

While Dyer was waging the bureaucratic battle in Washington, Schwable moved on to organizational matters. On 27 July, he wrote to the Marine Corps' Director of Aviation and proposed that personnel and equipment be assembled beginning 1 October in order to meet a 1 January 1943 commissioning date. The site chosen was to be the Corps' newest and most modern air station, just being completed in a remote, swampy area called Cherry Point, North Carolina. He also recommended that he be given command of the first night fighter squadron, which was now designated VMF(N)-531. These recommendations were approved.<sup>6</sup>

The situation at Cherry Point was a stern test of Schwable's organizing abilities. He later described the problems:

We started with nothing. In fact, we were the first combat squadron to move in one of the new hangars down there. . . . When I moved into the office, there were about three packing boxes around there. That was our desk and that was our chair. . . .

So there was a question of getting our facilities ready; we had to get all the squadron equipment, including jeeps and trucks, and, well, everything that an outfit needs. . . . And with the radar, there was nobody, excepting a few men in my squadron, that had been to a Navy radar school.

Then there were the problems that stemmed from being on a new base with an orphan airplane and unknown radar complexities. Schwable continued:

We had never built anything like the GCI [ground controlled interception] station. It was just like when you walked in and [they] said, "Okay, build a squadron." The supply department down there at Cherry Point was fairly new, and [there were] all kinds of spare parts they did not have. They had practically nothing for the PV because ours were the only ones the Marine Corps had ever had, and the Navy hadn't had them [equipped with interception radar].<sup>7</sup>

Nevertheless, Schwable forged ahead. He now

# Brigadier General Frank H. Schwable

Brigadier General Frank H. Schwable was born in 1908, graduated from the U.S. Naval Academy in 1929, and commissioned in the Marine Corps that same year. Quickly moving to a career in aviation, he won his wings in 1931.

The following year, he was detailed for duty in Nicaragua with an aircraft squadron of the 2d Marine Brigade. While there, he was awarded the Nicaraguan Cross of Valor for hazardous attacks on "armed bandits."

Returning to the United States, he served at different bases until ordered to the Bureau of Aeronautics in the Navy Department, Washington, D.C., in 1939. This led to an assignment, in November 1941, to the American Embassy in London as Special Naval Observer.

Schwable crossed the Pacific and got as far as Cairo, Egypt, when the Japanese struck Pearl Harbor. Summoned back to Headquarters Marine Corps and promoted to lieutenant colonel, he was sent to form up and command the first Marine night fighter squadron, VMF(N)-531, in 1942.

Scoring four kills, he led his squadron in the Southwest Pacific in developing the brand-new tactics for night fighter planes, resulting in the award of both a Distinguished Flying Cross and a Legion of Merit for his actions from September 1943 to February 1944.

Leaving his squadron after 72 night combat missions, he moved to Commanding Officer, Strike Command, in March 1944, and his performance there was recognized by a second award of the Legion of Merit. Returning from overseas in November 1944 and now a colonel, he began a sequence of multiple peacetime assignments to Chief of Naval Operations, Headquarters Marine Corps, National War College, Marine Aircraft Group-12, and Commander in Chief, Pacific.

The war in Korea brought him to Chief of Staff, 1st Marine Aircraft Wing, in May 1952. During the next few weeks his "exceptionally meritorious achievement" was noted in the award of his third Legion of Merit.

On 8 July 1952, however, his plane was shot



Department of Defense Photo (USMC) 68297  
*Then LtCol Frank H. Schwable.*

down, and Schwable became a prisoner of war until 6 September 1953. During this time, as a senior officer, he was forced to make radio broadcasts of Chinese Communists propaganda. Upon his return to the United States, a court of inquiry was held. It recognized that Schwable's "confession" was very damaging. It concluded, in April 1954, that his conduct was "excusable on the ground that it was the result of mental torture of such severity and such compelling nature as to constitute an excuse for his acts."

Limited assignments followed at Headquarters in Washington and at Aircraft, Fleet Marine Force Atlantic, in Virginia. On 30 June 1959, he retired to Round Hill, Virginia, with a promotion to brigadier general for his heroism in World War II. His other awards included a total of three more Distinguished Flying Crosses and 11 Air Medals. He died on 28 October 1988.

wrote the first table of organization for a VMF(N) squadron which included its own GCI radar section, and he sent a barrage of requests to man and equip it. In the meantime, he worked on the basics of the operational mission.

First were the problems of instrument and night flying. Marine aviators were required to have instrument ratings after 1938, but were taught a crude method which was just about good enough to get them out of an unplanned weather situation. Indeed, many aviators of the period felt instrument flying was an emergency procedure rather than a means to an end. Deliberate flight in cloud, if not actually prohibited, was considered foolhardy, even though from 1938 on, tactical aircraft had an artificial horizon, a gyroscopic compass, and a two-way radio.

To improve his own instrument skills and qualify on large twin-engine planes, Schwable went to Fort Worth, Texas, in September 1942 to attend a school under pioneer instrument flyer and holder of the Navy Cross, Major (later Lieutenant General) Karl Day, USMCR. There he flew ex-airline Douglas DC-3s, which the Navy had impressed as the R4D-3, and learned "attitude instrument flight," using the artificial horizon as the primary instrument, an improved system Day had developed to short-cut the traditional methods which used cruder instruments. Ability to fly on instruments was essential for night fighter pilots who needed to keep spatially oriented at night or in clouds, before they could hope to have success in combat. Instrument flying had been so neglected and underdeveloped in all the Services that one Marine night fighter pilot sent to Britain in early 1943 was moved to remark, "Without Karl Day's school, I would have died on my first flight in England."<sup>8</sup>

On his return, Schwable found enough people and equipment in place at Cherry Point by mid-October to commence operations for night and instrument training. Spurred by reports of frequent night air attacks at Guadalcanal, he requested that the commissioning date be moved up again.<sup>9</sup> This was approved. On 15 November 1942. He notified Headquarters Marine Corps:<sup>10</sup> "Marine Night Fighter Squadron 531 commissioned this date. LtCol F. H. Schwable Commanding."<sup>11</sup>

Major (later Brigadier General) John D. Harshberger, a tough and fiery former aviation cadet, was appointed executive officer (XO). A veteran pilot with more than 2,400 hours of flight

time, he would play a large role in the success of the new unit. Three other officers and 46 enlisted men were detailed to flesh out the squadron's ranks.

The task was now to forge a cohesive chain of man and machine: equip the PVs with radar and armament; train pilots to fight at night in multi-engine aircraft; become competent in AI radar and gunnery; and create a GCI system using an untried radio communication technology—pioneer work all.

#### *Growing Pains at Cherry Point*

Flight operations began humbly enough in a pair of North American SNJ-4s that were wheeled out of the Navy in late October, along with the use of the station Curtiss SNC-1 trainers.<sup>12</sup> Link instrument trainers—the earliest flight simulators—were set up as well in a corner of the squadron's unheated, unlighted hangar.

Within a week, pilots began practicing night landings, using just runway lights to see by rather than the usual floodlights or wing landing lights. (Floodlit airfields in the combat zone would be an invitation to enemy bombing.) By 1 December, they were practicing night tracking by following blacked-out target planes, a skill that would be important since identification and gun attacks had to be done visually.

Personnel now began arriving in significant numbers. Their training ranged from formal schools to none at all. Except for a few old hands, most pilots came straight from flight training via Karl Day's school. The first newly-designated aviator to report on board was Second Lieutenant Duane R. Jenkins, USMCR. He would gain the squadron's first night victory within a year. The ground radar program got a boost on 18 December when the squadron's first GCI controller, First Lieutenant William D. Felder, Jr., arrived from Orlando where he had trained in RAF techniques at the Army Air Forces School of Advanced Tactics. The next day, two Army officers and eight civilian engineers arrived to install the GCI equipment, a Canadian copy of the British set. It was a non-portable system, but it was a start.

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<sup>8</sup>The North American SNJ was the principal advanced trainer of the war: single Pratt and Whitney R-1340 550 hp engine, constant speed propeller, retractable gear and flaps.



Photo from VMF(N)-531 War Diary, 1942-1944

*Built by Vega Aircraft Corporation, which later became known simply as Lockheed Plant A-1, the squadron's first gun- and radar-equipped PV-1s were delivered in the spring of 1943.*

However, the lack of airplanes was of major concern. As 1942 drew to a close, it seemed that the deliveries of the PVs and the SBDs would be delayed indefinitely, and without more airplanes none of the GCI controllers now assigned to the squadron could be trained—let alone the pilots. Schwable and Dyer scratched around some more, and in a familiar way, found some planes the Navy did not want.

In 1940, the Netherlands government had ordered 162 Brewster Model 340 Buccaneer scout bombers.\* Once described as “one of the least

successful combat aircraft put into production in the USA” during the war, a number of the ungainly, single-engine planes were gathering dust when the U.S. Navy “repossessed” them, labeled them SB2A-4s, and transferred them to the squadron.<sup>13</sup> The squadron’s pilots were dismayed to discover the Brewsters had metric cockpits with placards in Dutch. They gave trouble from the start.

At the end of 1942, Schwable formed a small task force to be sent to England to learn the night fighting trade at the working level. This probably grew out of an urgent message from the Commander South Pacific, Admiral William F. Halsey, who made a plea for a minimum of six radar-equipped night fighters to be sent [at the] earliest [possible] time.<sup>14</sup> Hardly possible, since they did not exist then.

The team was led to England by Lieutenant

\*The SB2A-4 Buccaneer was built by the Brewster Aeronautical Corporation, and was powered by a Wright R-2600-8 of 1,700 hp with a Curtiss electric propeller. It was armed with eight small .30-caliber machine guns, and had a top speed of 200 knots.

Colonel Edward A. Montgomery and consisted of pilots, radar operators (ROs), and GCI controllers—18 officers and men in all. When they returned in the late spring of 1943, they formed the backbone of the operational training effort for VMF(N)-531 and night fighter squadrons yet to come. On New Year's Eve of 1943, Schwable noted in his diary that the squadron now had 11 officers, 1 warrant officer, and 78 enlisted men on board, and that its pilots had logged 250.7 hours.

January was a disastrous month of bad weather, Brewster problems, and accidents. Even though the pilots were by far the most qualified instrument pilots in the Marine Corps at the time, they were by no means "all-weather." In addition to the continuing problems of instrument flying, visual navigation itself at night presented a big enough challenge to the new pilots, who seemed to get lost with depressing regularity.

Operations with the Brewsters quickly turned into a shambles: the contact points of the Curtiss electrically controlled propellers began burning out; a plane lost a tail wheel locking pin and a ground loop was narrowly averted; and the rudder pedals disconnected on another flight necessitating a "semi-emergency" landing. Then a pilot had his landing gear stick halfway and got them down by an emergency procedure. Another had a hydraulic failure. And all this in the first two weeks! As a result, Schwable had to limit them to day flights, until "a few more of the little 'bugs'" were ironed out.

In January, Schwable went to Norfolk, Virginia, to check on the progress of the armament installation of the squadron's first PV-1. The installation consisted of six fixed .50-caliber machine guns, two more in an electric upper turret, and two .30-caliber flexible guns in a bottom tail position. In the meantime, arrangements were underway for the installation of the SCR-540 aircraft interception radar at the Naval Air Station, Quonset Point, Rhode Island. This was a copy of the first operational British AI radar called Mark IV.

After some frantic activity with the Curtiss technical representative, the Brewsters got back into the air. In February, a green second lieutenant overshot on landing while solo and wrecked his SB2A-4. Four days later, another lieutenant ground-looped an SNJ. Accidents such as these were common in all Services throughout the war and reflected the very low average experience of the pilots.

On 15 February, the squadron got its first look at a PV-1 Ventura (equipped with radar but no guns) when one was ferried in. Like many wartime aircraft, the PV had a curious ancestry. Derived from the Lockheed Lodestar airliner, then built to a British specification, and subsequently ordered by the Army Air Forces (AAF) as the B-34, the first batch of Navy PV-1s, including -531's, came from the AAF allocation.

Pilots found the large and heavy machine relatively fast. It could do perhaps 257 knots all out at sea level (with drop tanks).<sup>\*</sup> But the plane was demanding to fly. Although its "service ceiling" was listed as 26,300 feet, it was really designed for low altitudes, with limited performance above 15,000 feet. In case of an engine failure, the pilot had to execute immediately an intricate sequence of actions. There were eight fuel tanks which required careful management. In addition, due to masking by the unusual instrument panel night lighting system, the altimeter could not be read below 2,000 feet, "a rather important range in night landings," Schwable acidly observed.

The electrical systems, air intercept radar, and guns gave constant trouble at the beginning, and there were innumerable ferries to Norfolk and Quonset to try to correct the problems. Batteries were so scarce, for example, that a pilot actually had to fly to Raleigh to remove one from a crashed PV. In the meantime, the Marine Corps' first successful airborne test of "Very High Frequency" radio was carried out by another squadron pilot in an SB2A-4 on 25 February.

On 27 February, the squadron's radar department made its first "real" interception after many months of "patient and arduous instruction." This may well have been the first GCI/AI interception conducted by an operational unit in the United States. Another capability of radar was demonstrated on 6 March, when a pair of aircraft were "steered" home when weather closed in.

At this time members of the squadron became involved in "Project 88." This was the Marine Corps' first program to train its own GCI controllers and operators (using RAF and AAF trained instructors). The project formulated Marine doctrine for GCI and night fighter control which would first be practiced in combat by VMF(N)-531. It was a system which used radar, a con-

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<sup>\*</sup>Powered by Pratt and Whitney R-2800-31 engines with 2,000 horsepower and single stage superchargers.

troller, and several operators to direct fighters.\*

The GCI radar set the squadron would take into combat was now just coming into production by General Electric, and Major Robert O. Bisson and two men were sent up to Schenectady, New York, to learn the system.\*\* This new set known as the SCR-527A was a copy of the original British GCI with the virtue of portability, compared to the previous set which demanded a fixed site installation.

Even though availability of the sole radar-equipped PV-1 was sporadic, the airborne training of the radar operators now commenced in earnest. After fine-tuning a welter of knobs, they would gaze intently at the two cathode ray tubes of the Mark IV radar, hoping to pick out a target from the interference "noise" on the scope. On the AI radar, energy reflected from the earth's surface flooded the scope at a range equal to the height above the ground. Detecting an aircraft in or beyond this clutter was impossible and was the radar's greatest limitation. Thus, the radar operator had to form a mental picture of the intercept from elevation and heading scales that were anything but precise. Estimating closure rate had to be done by eye. He then passed verbal directions to the pilot by interphone.

The pitfalls were many: failing to slow down closure rate could result in overrunning the target, and failing to assess the target's heading could result in a series of ever-diverging turns until the target was lost. But when done right, the radar operator talked the pilot into a position about 600 feet astern and slightly below the target, for a visual identification and attack. Like GCI controlling, there was much art in the airborne radar trade.

In the ordnance area, the training of "radar gunners" proceeded as well. The gunners attend-

\*They used different radars for early warning, for plan position indications for control, and to determine altitude and correlate IFF returns. The controller, an air-ground officer, directed the fighter by voice radio, and was assisted by a team of enlisted operators who plotted tracks, derived altitudes, and checked airspeeds. Controlling was more art than science in this era, and required a facile mind in order to place a fighter less than two miles astern, slightly below the target, and at a compatible airspeed.

\*\*Major Bisson, a brilliant radar specialist of modest demeanor, would become the officer-in-charge of the squadron's radar section in the Solomons, later direct the highly successful air defense of Okinawa in 1945 as Commander, Marine Aircraft Group (MAG) 43, and retire as a major general.

ed a brief course, living in tents, and practiced firing at sleeves towed by squadron SNJs (an unavoidable duty for the pilots involved). Then they were checked out in the roomy, electrically-operated turret of the PV and fired air-to-air on sleeves. Later the squadron made a field modification on the turrets to align them with the nose guns, so that all eight .50-caliber machine guns could be aimed by the pilot. At the time this was the largest array of machine guns in any Allied fighter.<sup>15</sup>

From 13 March on, air-to-air gunnery was carried on by pilots in SNJs with .30-caliber machine gun installations firing through the propeller arc. Major Harshberger made the first gunnery flight, and Schwable was very pleased with the ordnance crew "because the prop came back without holes!"

Despite continuing problems with spares and crashes, intensive flight operations resulted in the squadron's 25 pilots logging 834 hours in February and 1,203 in March. No one deserved a nickname more than "Iron John" Harshberger who outflew everyone from the New Year on.

But Schwable in Cherry Point and Dyer in Washington continued to face a seemingly endless flow of problems. There were radio limitations, radar calibration delays, poor results with the plane radar, parts shortages in numerous critical categories, and delayed or improper installation of equipment on planes sent to other bases for service.

On 1 April 1943, the Marine Corps' night fighter organization expanded with the commissioning of Marine Night Fighter Group 53 (MAG[N]-53), along with Headquarters Squadron 53, Service Squadron 53, and a new fighter squadron, VMF(N)-532. Schwable became the MAG's first commanding officer, and Harshberger moved up to command VMF(N)-531. (MAG-53 would eventually train eight night fighter squadrons and send seven into combat.)<sup>16</sup> Due to the uniqueness of -531, Headquarters Marine Corps ordered that, until ready for tactical deployment, the squadron would be considered a "Fleet Marine Force organization" directly under the Commandant.

The squadron transferred all its Brewsters and SNJs to VMF(N)-532 on 20 April, even though fully equipped PVs were slow in coming. By 2 June, -531 still had only three complete aircraft on hand. This would be the overriding reason for the squadron's deployment to combat in three phases.

Schwable summarized his deep concerns in a 28 May memorandum to Dyer:

If it is the desire of the Bureau to have this unit [MAG(N)-53] proceed to the combat zone in an airplane that is admittedly makeshift for the job, with guns that may or may not all fire, and with instruments that are difficult to read, and with radar that so far has an average of one out of three working, this unit will plan accordingly and accept, without comment, the experimental installations furnished.<sup>17</sup>

In the meantime, Bisson, now a lieutenant colonel, had departed in May with a small detachment to set up the new GCI radar at Marine Corps Air Station (MCAS), El Centro, California. In June, the ground crew section under a captain proceeded by rail, followed by the flight section of six fully—equipped black PVs under Schwable—now a colonel and back in command of the squadron as of 1 June.

At El Centro, ground, radar, and flight sections were reunited in the fearsome desert heat for a final three-week shakedown, with the primary

goal of getting the controllers comfortable with the new GCI radar. Then the ground troops embarked on the *President Polk* (AP 103) on 16 July for Noumea, New Caledonia, and the radar section plus all material sailed on the *Hammondsport* (AKV 2) for Espiritu Santo, New Hebrides, on 30 July.

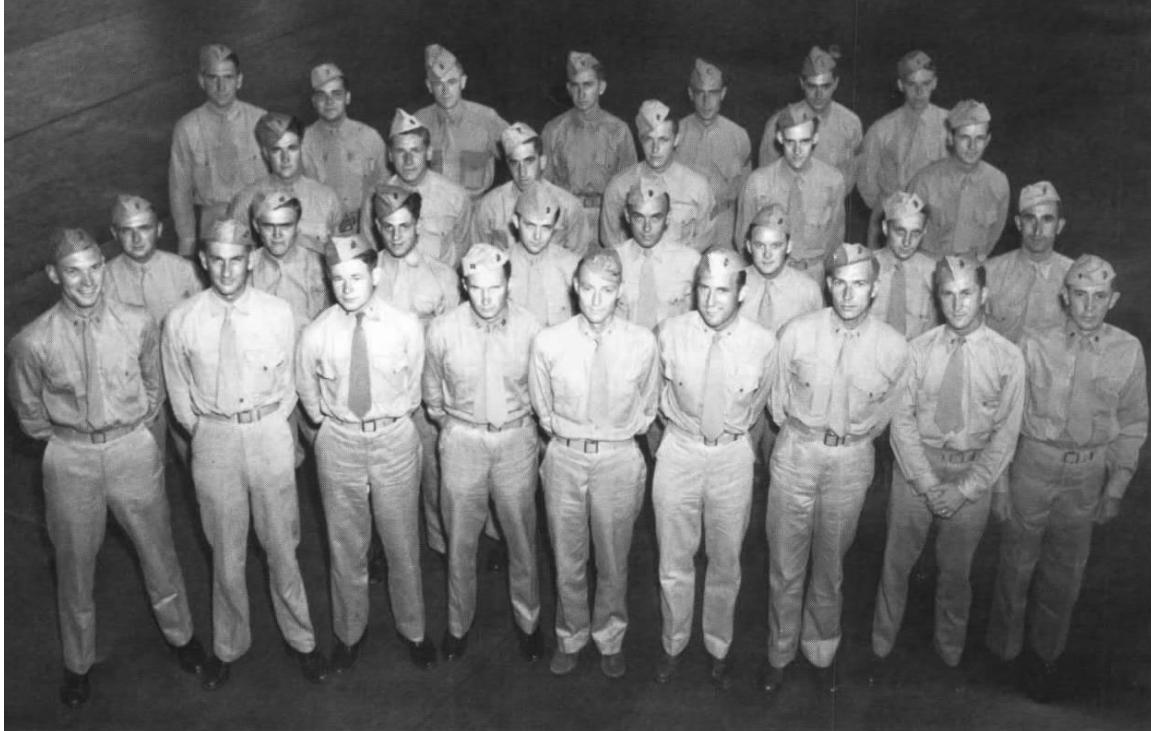
Schwable now wrote a long, frank report on the squadron's readiness. After noting the good qualities in personnel and equipment, he pointed out that 60 percent of the ground crews were "very new to the service." They could be trained, but a continuing problem was and would continue to be the severe limitations of his PVs:

45 to 55 minutes to climb to 20,000 feet.  
Very little maneuverability . . . above 15,000 feet.  
Very slow acceleration in level flight above 10,000 feet. . . . In view of the foregoing . . . the undersigned cannot view the possibility of successful night fighter operations with the PV-1 . . . unless the enemy operates below 15,000 feet.<sup>18</sup>

It was to be the squadron's good fortune that the enemy did!

*Squadron members gather on the USS Long Island's deck shortly after leaving San Diego bound for Pearl Harbor.*

Photo courtesy of BGen Frank H. Schwable, USMC (Ret)



### *To the Solomons and War*

On 1 August, the six PVs were loaded on board the *Long Island* (CVE 1) at North Island, San Diego, bound for Pearl Harbor, accompanied by the flight crews (nine officers and 21 men). Enroute, Schwable conducted a vigorous PV weight reduction program and ordered every non-essential item removed. A sizable pile of brackets, de-icer gear, ventral guns, and even range receivers grew on the deck, and all was alleged to have been thrown overboard despite dire predictions of what the Bureau of Aeronautics would do—if they ever found out.<sup>19</sup>

The aircraft were lifted off ship at Ford Island, Pearl Harbor, and flown to nearby MCAS Ewa on 9 August to prepare for the long ferry trip 10 days later. The route was via six successive islands, with a longest leg of five hours, which did not tax the range of the Ventura. Arriving at Espiritu Santo in the New Hebrides Islands on 25 August, Schwable and Harshberger quickly flew to Henderson Field, Guadalcanal, and two days later up to Banika, one of the Russell Islands, to survey the situation.

The main threat still emanated from Japan's "Fortress Rabaul," with its well-protected Simpson Harbor, five surrounding airfields, strong anti-air defenses, and an excellent radar network. However, with the evacuation of Guadalcanal by the Japanese on 7 February, the Allied forces—composed of Royal New Zealand Air Force and Army units, now took the initiative. Successful landings by Army and Marine units in the Russells, at Segi Point on New Georgia with the seizure of Munda Airfield, and then Barakoma Beach, Vella Lavella, were quickly followed with airfields constructed by Seabees and Army engineers to increase pressure on the Japanese. Strikes on Rabaul and a wide variety of enemy airfields could now be made.

Japanese night raids nevertheless continued unabated, and Schwable and Harshberger were surprised to find an Army night fighter presence already at Guadalcanal. The 6th Night Fighter Squadron with its Douglas P-70 planes had already scored the first U.S. night victory in the Pacific, but the P-70s' poor altitude performance would limit their effectiveness.

Meanwhile, VMF(N)-531 came under control of the Commander, Aircraft, Solomons, the remarkable combined command that had grown out of the hodgepodge of Marine, Navy, Army, and New

Zealand aviation units from the early days of Guadalcanal. ComAirSols was Major General Nathan F. Twining, USA, who would be succeeded by Major General Ralph J. Mitchell, USMC, on 20 November. All planes were organized by 24 October into type commands such as Strike, Bomber, and Fighter. Fighter Command also was responsible for land-based "information centers, fighter direction centers, radar nets and AA [at] air-fields."<sup>20</sup> VMF(N)-531 would soon discover that control of planes from a ship would be another matter entirely.

To adjust their radar to the squadron's new operating area, Bisson had the equipment set up with water as a reflective surface, since it was clear that GCI sites would necessarily be sited near water in the combat zone. These tests flew in the face of warnings in the British manuals of the impossibility of calibration due to changing tides. Bisson then conducted a series of innovative experiments in which he found that beach sitting could actually be superior. He next derived a simple set of altitude corrections for tides and greatly streamlined the lengthy calibration process itself. The correction was 100 feet per mile per foot of tide and was simply crayoned over the chart at the radar operator's position. It was a ground-breaking achievement; it produced a brilliant, yet simple, solution to a very complex problem which paid off many times later, since accurate altitude information was essential for a successful interception.

On 11 September, five PVs and their aircrews, plus 16 ground crewmen brought up from Noumea, New Caledonia, flew to Banika in the Russell Islands to commence combat flights (without GCI). Three days later, Schwable and Harshberger flew the first night combat air patrols.

On 16 September, Schwable and another plane piloted by Lieutenant John E. Mason with radar operator Staff Sergeant Ralph W. Emerson and gunner Corporal John J. Burkett took off from Banika to work with the pioneer GCI site. An enemy threat at Guadalcanal postponed the GCI work, so Schwable took a vector course for Russell and radioed Mason. Then all radar and radio communications with Mason ceased suddenly. Although a massive air search was undertaken the next day covering over 4,000 square miles, no trace of Mason's aircraft was ever found.

There were six scrambles against hostile bogies (Japanese planes) in September—all without



Photo courtesy of Maj William Henson, USMC (Ret)

*A PV-1 parked on the crude airstrip of a Pacific island.*

result due to the inability of the controller to get meaningful altitude information or quick plots out of the ineffective radar there. The eager pilots felt extremely frustrated.

In the meantime, realizing that shipboard control would soon be used on combat air patrols, Schwable had embarked on the *Lardner* (DD 247). He made the first try at a night ship-controlled intercept, "but there were many other planes in the air, and the attempt had to be put off," which did not augur well for the future. On the other hand, the radio communication was reported as "highly satisfactory."

Three PVs flew up to Munda, on New Georgia Island, late in September. Schwable stood the first night alert there on 5 October, and a few unusual rules of engagement were worked out: Marine night fighters were to take all bogies below 15,000 feet and Navy F4U-2 Corsair night fighters all those above. All night fighters were to remain outside the antiaircraft and searchlight zone, and

all night fighters were to remain grounded if Air Force P-38Js were up for searchlight interception. The six F4U-2s were the Navy's first deployment of radar night fighters.<sup>21</sup> However, the ships they were intended to protect were never really able to provide adequate night fighter control during the campaign. Further, the Army controllers at Munda decided only one night fighter could be controlled at a time, so the Navy and Marines were supposed to alternate nights. When VMF(N)-531 was ready to bring in its own GCI equipment, it was blocked by an Army officer.

Thus it was a relief to the squadron to move its own GCI to Vella Lavella in late October to cover the forthcoming landing of the 3d Marine Division on Bougainville, scheduled for 1 November. Schwable now had his hands full as a commanding officer with GCI and planes on Vella Lavella, while also using Munda, with the squadron's maintenance base back on Russell. The operational situation was characterized by many

patrols, many bogies, and no AI or visual contacts of enemy aircraft. From 14 September to 27 October, the squadron flew 47 night combat missions—including eight scrambles—and attempted to close on 17 bogies. The principal reasons for failure were the absence of precise control and inexperienced controllers who were unused to the requirements of night fighters.

Nevertheless, VMF(N)-531 was now approaching a time and place where its true value would be confirmed. The assault on Bougainville would bring the greatest challenges yet to the Marine night fighters. The island's commanding position made it the logical location for airfields from which the final reduction of Rabaul by airpower rather than amphibious assault could take place. The landing there would lead to some of the biggest day air battles of the Pacific and—finally—prove the concept of night fighters.

VMF(N)-531 would come under the operational control of Brigadier General Field Harris, USMC, Commander, Aircraft, Northern Solomons. The squadron's main mission would be night air defense in the amphibious operating area. Only a handful of amphibious ships—including four vital AKA transports—were available for the landing and the loss of even one would seriously compromise the assault.

The night preceding the landing (31 October) saw naval aviation's first night victory when VMF(N)-531's GCI guided a Navy F4U-2 onto a Japanese "Betty" bomber which fell in flames.\* This was followed on the night of 13-14 November by a Marine sortie by Captain Duane R. Jenkins and his two-man crew. Flying in ideal conditions with moonlight, he was skillfully vectored (directed) to a single bogey. His subsequent combat report related:

The bogey appeared at 4,000' [range] on the scopes, going from right to left. A moment later the bogey came into sight . . . a Betty. He turned . . . on its tail at 0418. At 1,500' [range] he saw exhaust flames. . . . At 800' he gave a 4 second burst from below the slip stream of the enemy.

\*"Betty" was the code name given to the Mitsubishi G4M-2 torpedo bomber. Its twin engines were each rated at 1,350 hp at 10,000 feet altitude. With a crew of 6-7, it could carry a bomb load up to 4,840 lbs. Armed with two 20mm cannons and four 7.7mm machine guns, it had a speed of 235 mph at sea level.



Photo courtesy of 1stLt Wesley Johnson, USMC  
*LtCol Frank H. Schwable confers with his plane captain, TSgt John Barna, who not only managed to keep his skipper's plane flying, but also managed to "go along for the ride" on 68 flights.*

The starboard engine nacelle of the Betty started flaming, and it went into a shallow dive to about 4,000', during which the fighter caught it again with a short burst into the port wing root. He gave a third burst and the turret gunner gave it a two second burst in the fuselage, as the fighter passed from left to right. The Betty went into a steep dive flaming, and was seen to explode as it hit the water at 0420.

During the Bougainville campaign, the squadron managed to fly an average of three combat patrols per night and a similar number of administrative and transport flights. This stretched crews and planes to the absolute limit. A 6,000-mile supply line resulted in chronic parts shortages, and planes began to be operated in marginally airworthy status; Harshberger's aircraft, for example, flew around with a cracked tailwheel assembly for months for lack of a replacement.

Maintenance crews began performing minor miracles in what would have been depot level repairs stateside—if they had been attempted at

all. Tubes and rings which had cracked in the tropical saltwater environment were expediently repaired with tape and shellac. A fractured wing spar was repaired by carefully welding metal straps around it. Much later, an entire nose section including radar and guns was grafted onto a PV-1 bomber by an ad hoc team of Marines and sailors to create virtually another precious night fighter in the combat zone.<sup>22</sup> Adaptors for carrying bombs or drop tanks with a cockpit release switch were fabricated from scratch.<sup>23</sup>

These activities—particularly those involving other Services—did not occur in a vacuum, and an intricate system of barter using beer, whiskey, and medicinal brandy as currency evolved (as well as surreptitious “acquisitions”). A plane was pressed into duty to go to Sydney, Australia, more than once to procure alcoholic lubrication for essential parts and services. The unofficial suppliers of PV-1 parts were Navy and New Zealand squadrons, while radar parts came from the Army Air Force.

When, at odd hours, the squadron's ground echelon found themselves denied rations from an Army-run mess, due to the squadron's round-the-clock maintenance operation, the enterprising Marines first located desirable cases of rations with field glasses by day, and then appropriated them by night. Even grander examples of the art were the acquisitions of actual aircraft: an abandoned Grumman F4F-4 Wildcat and, later, an F6F-3 Hellcat. (The latter would later play a role in an interesting experiment in night attack.) These aircraft were maintained by the squadron and operated as AI targets and for administrative and search-and-rescue flights.

About this time there arose considerable discussion as to the proper employment of night fighters over the conquered area of Bougainville. Both ground and task unit commanders preferred to pull the night fighters away from approaching enemy aircraft so that anti-aircraft guns alone could deal with the threat. The explanation for this was twofold: a belief in the efficacy of anti-aircraft fire, even though it had not been especially effective, and a belief that a lot of such gunfire—which could be seen and heard—would help keep up morale. Schwable would devote much effort on a personal and written level to convince the higher powers otherwise, and, in the end, he would be proven correct.<sup>24</sup>

The squadron's airplane and aircrew situation saw a great improvement on 1 December when



Photo courtesy of TSgt Charles Budd, USMC (Ret)

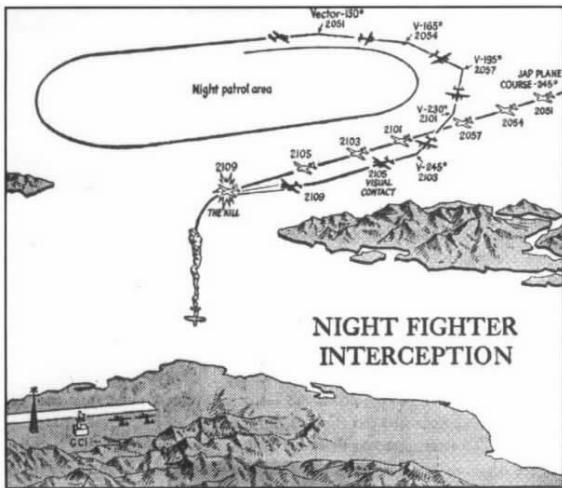
*The “Coral Princess,” piloted by Lt John E. Mason, was the squadron’s first loss, the aircraft disappearing while on a training mission in the vicinity of Guadalcanal on 16 September 1943.*

three Venturas with six pilots, six radar operators, and three mechanics arrived in the long delayed second echelon. Two nights later they had to face the squadron's first combat loss. The squadron's War Diary entry related:

Captain Jenkins took off to cover a task group and destroyer squadron . . . [which] underwent an air attack by fifteen to twenty-five [enemy] planes. . . . They made continuous bombing and torpedo attacks. . . . A plane was seen shot down in flames by another plane seven miles east of the [ship] formation. The PV-1 was the only friendly plane in the area at the time. Afterwards, the plane still flying showed friendly (by IFF), and flew east for about one minute where it was lost. . . . Nothing further was heard from the PV-1 and the plane did not return to base.<sup>25</sup>

Captain Jenkins, Technical Sergeant Charles H. Stout, and Sergeant Thomas J. Glennon were declared missing-in-action after an extensive air search. Jenkins was credited with a kill—believed to have been a “Betty”—based on the visual and radar evidence.

Three nights later, Harshberger with co-pilot First Lieutenant Wilbur E. Birdsall and his regular crew, radar operator Technical Sergeant James S. Kinne and gunner Staff Sergeant Walter E. Tiedeman, took off to patrol over Bougainville. The ground controller was the squadron's own Captain Owen M. Hines. Shortly after midnight,



*Diagram of a typical flight pattern of a VMF(N)-531 plane working its way into position for a kill.*

Kinne captured a bogey on his scope. Harshberger slowed to 130 knots, and closed to 2,500 feet range when he saw a twin float plane, an Aichi E13A "Jake," silhouetted in the moonlight, gently weaving, and making about 110-115 knots.\*

At 800 feet, he and Tiedeman both fired bursts from slightly below. Almost immediately, the "plane fell off the right wing, burning," and Tiedeman saw an object "similar to a parachute drifting away as it fell." Shortly, he saw "the plane in the water, looking like a ball of fire." Hines radioed Harshberger that ground personnel had also seen the falling "Jake." All the frustration had finally paid off; an all-VMF(N)-531 team, air and ground, had successfully defeated a night intruder in support of Marines on a beachhead.

The squadron now embarked on yet another sideline, brought on by the fact that the Japanese had to rely on nocturnal shipping to supply their forces on Bougainville. The Japanese Navy used hundreds of self-propelled barges in this effort. On the night of 7-8 December, Harshberger flew the first two bombing and strafing missions against the enemy's barges.

Most of the night patrols now saw the PV-1s armed with a pair of 100-pound bombs rigged with instantaneous fuses, which could be

\*"Jake," the Aichi E13A1, was a Japanese Navy reconnaissance float plane. With two engines and a crew of three, its 1,080 hp gave it a speed of 234 mph at 7,155 feet altitude. Armed with 3-4 machine guns, it had a bomb load capacity of 550 lbs.

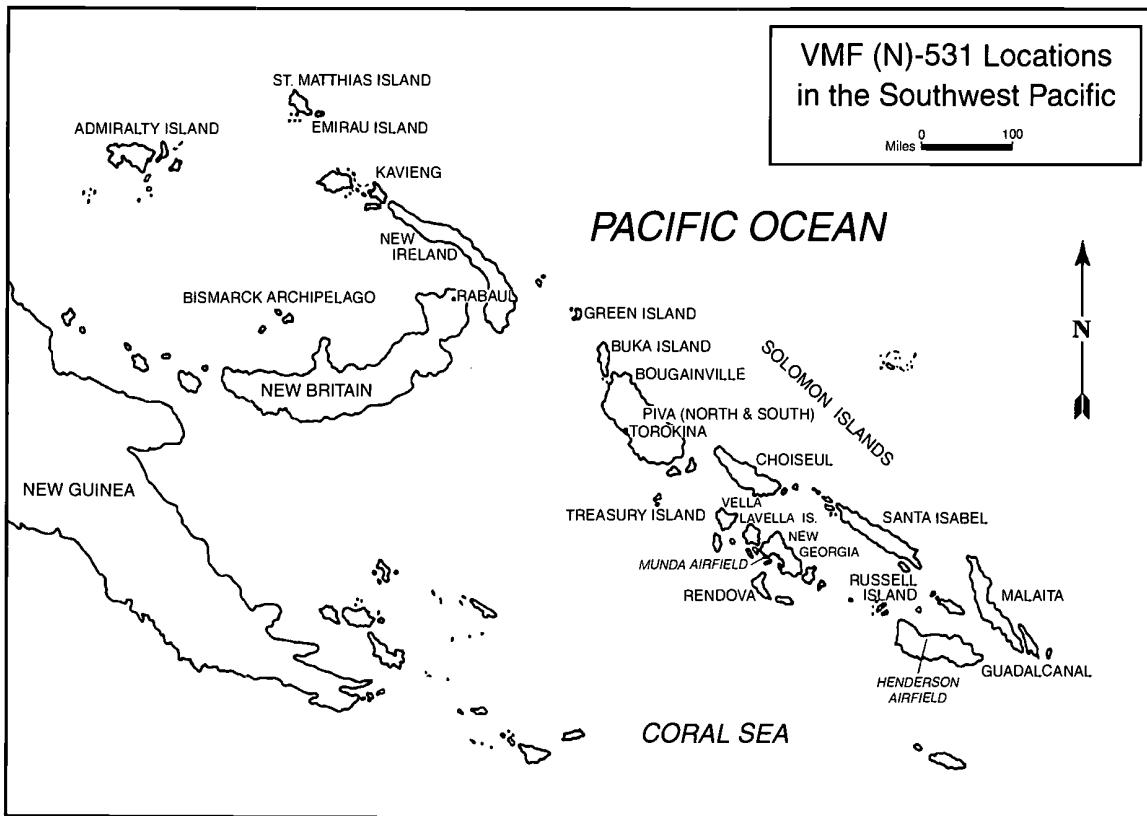
dropped on enemy positions beyond the Bougainville ground perimeter or in the neighboring Shortland Islands. Faisi Island came in for particular attention. On 11 December, Schwable dropped two bombs in the dock and ramp area on the west shore of Faisi, and watched in amazement as "the second bomb hit [with] a large explosion . . . followed by a series of explosions which covered half the width of the islands in flames." Photos taken during the day revealed a 200' x 200' burned area believed to have been a fuel dump. Schwable remained adamant that, while results of nuisance bombing and harassing attacks were gratifying, "night fighting is the principal business of the PV-1s." Harshberger, on the other hand, "enjoyed fighting his own little war" with night bombing.

The priority was clear when ComAirSols Fighter Command continued to assign a mission of "night harassing over enemy bases," well into 1944—probably because there simply were not very many suitable planes with night-experienced crews available, apart from the few AAF P-70s and some B-25s.<sup>26</sup> In the meantime, the Navy's F4U-2 Corsairs would enjoy their greatest successes. They totaled seven victories before leaving in May 1944, with three of their interceptions conducted by VMF(N)-531 controllers.<sup>27</sup>

The objective of the Bougainville landings had been higher ground inland where two large parallel bomber strips (Piva Yoke and Piva Uncle) were built. These would play a key role in the final air offensive against Rabaul. The squadron's operations moved to Piva Uncle on 9 January 1944, and Schwable immediately flew the first mission.

On 12 January, Schwable was airborne from Piva with his regular crew, radar operator Staff Sergeant Robert I. Ward and gunner Sergeant William J. Fletcher. They were vectored by -531's own Captain Thompson S. Baker controlling a total of five intercept attempts which yielded two contacts. As Schwable tried to close in on the second contact, Fletcher sighted a single engine monoplane with retractable landing gear (probably a "Kate") at 3,000 feet range.\* At 500 feet range, the pilot and gunner fired on it simultaneously, and "immediately the . . . plane exploded

\*The Nakajima B5N, called "Kate," was a single-engine torpedo bomber, armed with 3-4 machine guns. Its 700 hp engine gave it a speed of 205 mph at sea level. Bomb load was 1,100 lbs.



*The zone of operations for VMF(N)-531 during its tour of duty in the Southwest Pacific area in 1944.*

and burst into flames. In order to avoid the wreckage, the pilot swung hard left and felt a scorching heat as his right wing just cleared the flaming mass." The crew watched the plane explode again just before it hit the water; the crash was also seen from the shore 35 miles away. Schwable reported, "It had taken just 9 minutes from start to finish."<sup>28</sup>

#### *February 1944 Climax*

January 1944 saw several operational developments. The squadron's radar intercept section was moved from Vella Lavella to the Treasury Islands, where it could better cover a portion of the shipping routes. An 11-man detachment was sent to a fighter direction unit established by the Navy, which was now fully convinced of the value of such an asset to amphibious forces. The Marines would train the naval personnel in radar operations for the forthcoming landings on Green Island, which was to be another link in the Allied chain surrounding Fortress Rabaul. Major Thomas E. Hicks, Jr., in the meantime, spent three weeks on board assorted destroyers with fighter direc-

tion capabilities to instruct their crews further in the subtleties of night fighter control. In addition, the old hands were heartened by the arrival of the third and last echelon of five PV-1s and six pilots on 30 January. For the first time in seven months, the flight section was finally reunited.

February would see the climax of Japanese air attacks and the height of the squadron's successes. The groundwork was laid when, on 2 February, Hicks and Captain Kenneth J. Mudie, Bisson's chief technical assistant, were landed on Green Island to conduct a reconnaissance for potential radar intercept sites.

Clashes with the enemy planes began on the night of 5-6 February when Schwable and his regular crew took off from Piva and were vectored by the Army onto a bogey estimated at 15,000 feet. Scrambling for altitude, Staff Sergeant Ward, the radar operator, was able to make a radar contact at 12,000 feet, but the PV had to close to a range of 700 feet before Schwable could identify it as another "Betty." Pilot and gunner opened fire simultaneously and incendiary rounds were seen striking the "Betty's" fuselage which "wavered and slowly turned to starboard . . . and

[after another burst] . . . fell off into a vertical spiral or spin." The next day, wreckage and a fuel slick were found in the area which seemed to confirm the kill.

On 8 February, Colonel Schwable took on a second hat as Air Operations, Vella Lavella. The squadron's radar section was now controlling from its vantage point in the Treasures, while the PVs also began to stage there from Stirling Island. At last the squadron had sufficient aircraft to operate in multiple areas.

The night of 9-10 February would see the most exciting night combat yet, but it would be marred by the tragic loss of First Lieutenant Clifford W. Watson and his crew, radar operator Sergeant Jack H. Shirk, and gunner Sergeant George E. Brogna. Watson took off "in heavy weather," and after a

few moments, the Ventura was observed crashing into the water and bursting into flames. A crash boat was unable to recover the crew.

Later that same night, Harshberger took off from Piva. Eventually, Technical Sergeant Kinne made a radar contact at a range of 12,000 feet, near the PV-1's maximum combat altitude of 15,000 feet. As they struggled to close to within 4,000 feet, the large contact split into two blips on Kinne's scopes. Then closing in to 2,500 feet, Technical Sergeant Tiedeman identified two "Bettys" flying in formation.

Harshberger pressed into 1,500-2,000-feet range when the right-hand bomber opened fire with its 20mm tail cannon, followed immediately by its wingman on the left. Targeting the "Betty" on the left, Harshberger bore in still closer and

*VMF(N)-531 staff and pilots pictured in the Russell Islands: front row, left to right: Capt Jack Plunkett, LtCol John D. Harshberger, Col Frank H. Schwable, Capt Duane R. Jenkins; second row: 1stLt Clifford W. Watson, WO William F. Lane, 2dLt Robert A. Carvell, 1stLt Frank Abegg, Jr.; third row: Lt Thomas V. Finch (MC), Capt Robert Barry, Capt Howard P. Cross, Capt Harold O. Torgerson, and Capt Thompson S. Baker. Capt Jenkins, 1stLt Watson, and Capt Torgerson were later killed on operational or combat missions.*

VMF(N)-531 War Diary, 1942-1944



# Brigadier General John D. Harshberger

Brigadier General John D. Harshberger was born in 1911, received a bachelor of science degree from the California Institute of Technology in 1934, and two years later, entered the Marine Corps.

Eager to be a flyer, he trained at Pensacola, Florida, received his commission, and joined Marine Bomber Squadron 6 at Quantico, Virginia, in 1936. The next four years saw him gain experience in a series of different squadrons.

By 1943, now a lieutenant colonel, he received a critical assignment as executive officer of VMF(N)-531, the first Marine night fighter squadron. When it deployed to the Southwest Pacific, Harshberger proved to be a fiercely motivated pilot, chalking up four kills of Japanese planes, and moving up to squadron commander. His outstanding record from 11 September 1943 to 25 March 1944 resulted in the award of a Distinguished Flying Cross. His citation included references to "extraordinary achievement . . . 90 night combat missions . . . pioneer in the development of night fighters tactics."

His subsequent career symbolized the varied duties of Marine aviation; in China, Hawaii, and the United States, he held multiple senior billets in a number of Marine Aircraft groups and wings, with a Legion of Merit awarded to him



Department of Defense Photo (USMC) 68321  
*Then LtCol John P. Harshberger.*

for his leadership as commanding officer of MAG-11 in 1953.

On 1 November 1959, he retired and was advanced to the rank of brigadier general. He died on 11 November 1999.

opened fire with his six nose guns. The squadron war diary for that night recorded the next minute:

At this point the PV-1 was hit [with the white explosion of an HE shell] in the nose, putting five of the six guns out of commission. LtCol Harshberger continued to fire with the remaining gun. Sgt Tiedeman put one burst into the tail gunner of the "Betty" on the right [which then peeled off right out of range]. He then swung back on the bogey to the left and [fired] three bursts into the bogey . . . [then] the "Betty" . . . [which] had started to glow internally . . . [taking] on the appearance of a brightly lighted sieve

. . . lazied off into a steep nose dive.

A chase of the other "Betty" proved fruitless. With damage from the enemy's fire and fuel supply nearly gone, it was time to go home. Their radio had been knocked out and, approaching the home airfield, searchlights blazed on, followed by an antiaircraft barrage aimed at them. They finally were able to land, and Harshberger summarized the mission: "Never had so much fun in my life!"<sup>29</sup>

On the night of 14-15 February, while the Green Island amphibious task force moved into position, the squadron flew eight covering patrols, a new record. Schwable, as commanding officer, and Harshberger, as executive officer, flew

two each. Schwable's second patrol bore fruit. He was covering the first echelon on the attack force under the control of a Navy lieutenant on board a destroyer. When a bogey was spotted, the lieutenant put Schwable onto a tailchase, as the enemy began to head towards Rabaul. Ward got radar contact and at 2,000 feet, Schwable made out the unmistakable shape of a twin-float Aichi E13A "Jake." At 700 feet he fired a 13-round burst from each of his lower four nose guns and the "Jake's" engine caught fire. As the "Jake" slowed, gunner Fletcher fired so close at it, he thought he "could have hit the [pilot] over the head with his gun butt." Destroyer crews watched as "the flaming mass hit the water."

At dawn 15 February, troops from the 3d New Zealand Division landed on one of the Green Islands, a mere 120 nautical miles from Rabaul. Included among them was a detachment from VMF(N)-531 under Captain Hines. Within 36 hours, even before the Japanese garrison had been defeated, it was on the air providing, for the first time, radar protection for a landing force from the very start of an amphibious operation. The results were immediately obvious: two shoot-downs on the first night.

On the night of 16-17 February, as the new Green Island radar team commenced its first watch, the squadron put up patrols over the atoll. Schwable and his crew had the third patrol. Hines and his radar crew quickly located a bogey for them, which was then acquired on the plane's radar at a range of 5,000 feet. Staff Sergeant Ward, the radar operator, smoothly worked Schwable into a visual at 2,000 feet which "at first looked like a bright star moving slowly across the sky." The poor exhaust flame damping of Japanese aircraft was usually night fighter crews' first visual clue, and this time was no different: it was a "Jake."

At 300 feet, Schwable fired eight rounds each from the lower four guns, as did Sergeant Fletcher. "Instantaneously the ["Jake"] flamed and the wings flew up and back as if they had been jerked."<sup>30</sup> It was to be Colonel Schwable's last combat flight in the PV. With four victories, he was then the Allies' leading combat night fighter pilot in the Pacific.

A later patrol that night was flown by another veteran crew, First Lieutenant Jack M. Plunkett, with his RO and gunner, Staff Sergeants Floyd M. Pulham and Michael J. Cipkala. Hines vectored Plunkett after a bogey, and then Pulham got radar

contact at 4,000-feet range. At 400 feet, Plunkett saw a "Jake" making violent S-turns and he fired several bursts at the gyrating "Jake" from 350 feet. Later, Plunkett recalled seeing rounds strike the "Jake" without seeming effect, until suddenly "it nosed down into a vertical dive bursting into flames on the water."<sup>31</sup>

When Schwable arrived back at Vella Lavella, General Mitchell told him that he had made his last night combat flight, and he was ordered to report for further duty with ComAirSols. Mitchell had recommended him for the Navy Cross, but was overridden and he was given the Legion of Merit for his pioneer work and leadership of the squadron, in addition to the Distinguished Flying Cross for his combat actions.<sup>32</sup> Looking back years later, he would characterize his night combat experiences as "hairy, scary—and very satisfactory." He had flown 269 hours of combat in 72 missions for a total of 421 hours in the combat zone.<sup>33</sup>

On 18 February, Schwable again handed over the squadron to Harshberger. The Schwable-Harshberger commanding officer-executive officer relationship was a fascinating study in contrasts: two strong, highly intelligent men who both had exceptional experience and ability as aviators, plus an unusual degree of technical knowledge in the rapidly developing field of radar warfare. Of totally different temperaments, their relationship was durable and effective.

Schwable was the more cerebral of the pair, with a firm vision of what was needed, and to this end he produced a number of lengthy classified letters with very wide distribution. These carefully and clearly outlined all the aspects and problems of night fighting.\* They would greatly influence the conduct of future night fighting campaigns, as well as the later development of new weapons systems for "all-weather" fighting. He was an inspiration to his subordinates and personally charming, a skill he used to good effect in influencing others about this type of arcane warfare.

Harshberger, on the other hand, was driven, even obsessed, with bringing destruction to the enemy. He seemed oblivious to any obstacle and pushed himself well beyond what others believed to be normal limits. His courage and aggressiveness, coupled with a compelling sense of duty,

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\*For an example of Schwable's analysis, see Appendix A.

were greatly admired. The other side of this coin, however, was that he did not suffer fools gladly, which led occasionally to his nickname being inverted to "Harsh John Ironberger."

Both men flew an extraordinary amount during their tours, consistently more than any of the other pilots. Schwable alone averaged more than 84 hours per month, exceeded only by "Iron John." Each flew virtually every day—sometimes as many as five flights—and reputedly neither ever took a rest in the combat zone. Incredibly, neither was involved in any flying mishap in their hazardous flying environment. It is difficult to imagine the successful introduction of night fighting to the Marine Corps without the leadership of these two remarkable officers.

With Harshberger now commanding officer, he made sure that everyone in the squadron was kept busy. On 19 February, he departed Piva and, with a vector from Captain Hines on the ground, Technical Sergeant Kinne, the radar operator in the plane, made a radar contact. Harshberger stalked in to 300 feet and fired. "The fuselage of the 'Jake' instantly burst into flames as if it had been made of gas . . . [and] dropped off to the left into a steep vertical dive" into the water where it burned.<sup>34</sup>

Landing back at Bougainville, Harshberger was informed that First Lieutenant Thaddeus M. Banks and his crew, radar operator Staff Sergeant Burnell C. Bowers and turret gunner Sergeant Gilbert Jones, were missing on a barge search and strafe mission. He immediately refueled and took off on a five-hour search. He found no trace of Banks' plane or crew, but the following day, a pilot spotted a PV-1 wheel, cabin tank, and parachute.

The final week of February confirmed a dramatic elimination of the threat from hostile bogies. Fortress Rabaul had been effectively neutralized by air power in an unprecedented combined effort of American Marine, Army, and Navy, and New Zealand and Australian air forces. So Harshberger began complaining, "This squadron is hoping to be moved to some area where there will be more business. The [Japanese] seem to get the word when Night Fighters get into an area and they stay away at night."<sup>35</sup>

Flight operations would continue in the theater until the end of July, albeit with a sense of increasing anticlimax, laced with a few triumphs and losses. Harshberger flew the unit's first night patrol around Rabaul itself late on 29 February.

In the months to come, the squadron would have a standing dusk and dawn "freelance" patrol over Rabaul, without GCI control. While Rabaul put up no countering aircraft, its conventional antiaircraft defenses would remain potent.

The Japanese still supplied their isolated forces on Bougainville with barges, and First Lieutenant Francis E. Pierce, Jr., departed Piva on 3 March to do a search using flares. Harshberger came up an hour later and found five barges which Kinne illuminated with flares and which "conveniently held all in a straight line while being strafed," sinking three and possibly four in the process.<sup>36</sup>

On 13 March, Harshberger and his crew left the Torokina strip on Bougainville to patrol Empress Augusta Bay. After 45 minutes there was a head-on contact, and at a range of 8,000 feet, Kinne made radar contact, and at 1,500 feet they saw a twin float plane that looked "altogether different" from the now familiar Aichi E13A "Jake." Whatever it was, it was obviously Japanese, and Harshberger closed to 300 feet, fired, and ". . . almost instantly the . . . plane blew up . . . Sgt Tiedeman claiming the turret was momentarily enveloped in white, green and yellow flames." The plane fell in "hundreds of pieces."<sup>37</sup>

The crew later identified it as a "No. 14 Experimental Reconnaissance Seaplane" from captured photographs. It almost certainly was an Aichi E16A1—so new that no Allied code name had been yet assigned to it. (Later, it would be designated "Paul.")

On 21 March, the squadron would suffer the greatest tragedy of its history. The war diary entry reads:

Lt [Marvin E.] Notestine took off from Torokina at 0520 and patrolled until 0630 and then started home to Barakoma [Vella Lavella]. He was joined by Lts Pierce and Birdsall and they flew formation towards Vella Lavella. About 0650 Lt Pierce's wing clipped Lt Birdsall's wing. [Pierce's PV] burst into flames. Lt Birdsall's plane went into a spin. Lt Notestine barely avoided collision with Lt Pierce's flaming plane. Both the PV(N)s crashed into the sea . . . Lt Notestine circled low about the place . . . but saw no one afloat . . . nine lives were lost in the accident. No one was recovered.

Harshberger led the search effort in an F6F, assisted by First Lieutenant James H. Wehmer in an F4F,

and the squadron commander would fly an incredible 15 hours in the next 24, with 12 at night—but to no avail.

There would be no hostile contacts in April, and Harshberger began “a decided movement . . . to return the squadron to the United States for reforming and reequipping.” ComAirSols, Army Brigadier General Earl W. Barnes, concurred, and went on to praise the squadron’s “envious record,” noting that the dramatic reduction in enemy night air activity “has been largely due to the successful efforts of VMF-531 . . . with antiquated equipment . . . and an abundance of personal effort and ability of all members of the organization.”

On 6 May, Harshberger handed the squadron over to Captain Wehmer and then started home with seven pilots, three ground officers, 68 men, and all but three of the radar controllers. Harshberger’s record was remarkable: he had flown 756 hours in the theater, 433 hours in combat, and 100 combat missions. He would later receive the Distinguished Flying Cross for his combat actions and leadership. Along with Schwable, he was the Pacific’s leading Allied night fighter pilot with four confirmed victories.<sup>38</sup>

In the squadron’s waning days in the South Pacific there was one last triumph. On 11 May, First Lieutenant Notestine, and his radar operator Sergeant Edward H. Benintende, and turret gunner Corporal Walter M. Kinn made a contact while “freelancing” over the St. George Channel. Notestine saw a plane pass opposite about 200 feet below them, with its running lights on. He racked the PV around and chased it into the naval base anchorage at Rabaul’s Simpson Harbor. It appeared that the bogey—a “Jake”—was preparing to land, and Notestine fired at 400-feet range. The bogey “burst into flame and hit the water” and the crew watched it burn for a short time and sink.<sup>39</sup> It was the squadron’s twelfth and final victory and the only one without use of radar. Notestine would later receive the Air Medal for his achievement.

The last combat mission was flown by First Lieutenant Arnold B. Loken, a dusk patrol over Rabaul on 14 July. The next day, combat flight operations were secured, and the squadron prepared to leave the South Pacific. One sergeant, John Barnes, remembered the haphazard way in which the squadron personnel were returned home:

Coming home from Bouganville, we left

on an LCI to Guadalcanal to get a ship. . . . We waited for days for a ship to arrive. One day we were put on Higgins boats to get to a ship in the harbor. When we were halfway to the ship, the ship took off; and we returned to Guadalcanal. No one spoke for three days.

Sgt James, our parachute rigger, had three foot lockers full of Japanese souvenirs that he had acquired by trading whiskey with the troops on the frontline. Sgt James made a deal with the Beachmaster, by giving him a few souvenirs, to get us home any way possible. I was lucky. I got aboard the General Polk and arrived in San Diego after 14 days. The rest of the men were put on three LSTs at different times and took over 20 days to reach the States. We were scattered all over the Pacific.<sup>40</sup>

On 2 August, five PV-1s left Piva for Oahu. Three others were “condemned by naval authorities as overage and unfit for flying.” The rest were turned in at Hawaii. On 3 September, the ground echelon of six officers and 155 enlisted men left Bougainville and arrived in San Francisco. A young Reserve officer who was acting commanding officer, Captain Robert R. Finch, forwarded all records and equipment to Cherry Point and then disbanded the squadron that same day, “by telephonic order from Headquarters, U.S. Marine Corps.”

VMF(N)-531 would rise again to pioneer a brand new aircraft: Grumman’s fast and potent twin-engine F7F Tigercat. This would be a welcome change from the obsolete plane the squadron’s pilots had had to use. The Commanding Officer, Marine Aircraft, South Pacific, had made urgently clear the need for a major upgrade when, in his endorsement of Schwable’s historical summary, *Combat Experiences of VMF(N)-531*, he wrote:

The PV-1 airplane has been entirely unsatisfactory as a night fighter due to its low performance and other deficiencies. . . . It is recognized that the PV-1 was the only twin engined aircraft available for night fighter work at the time VMF(N)-531 was organized, and that single-engined aircraft were later converted to use as night fighters for the same reason.

All Marine Corps pilots who observed



Department of Defense Photo (USMC) 226616

*Squadron F7F Tigercats sit on the ramp in front of one of three former Japanese hangars at Nan Yuan Field in Peiping, China, in December 1945.*

and trained with night fighting units in England expressed the opinion that single-engined aircraft would never be entirely satisfactory as night fighters. They strongly recommended that a suitable twin-engined type be adopted. The operations of night fighter aircraft in this area have borne out this contention, and it is believed that no single-engined aircraft will ever be as satisfactory or give as good results as a twin-engined airplane designed for the purpose.<sup>41</sup>

#### *Tigercats in Texas and China*

The returning members of VMF(N)-531 took justifiable pride in the unit's achievements. It had been the most successful American night fighter squadron to date with an unequalled number of victories in the Pacific, while using an unsuitable aircraft and obsolete radar in demanding circumstances. The effective teamwork of Marine night fighter crews and ground controllers—born through much practice—had vividly demonstrated a new form of aerial warfare ahead of the other Services in the Pacific. The ability to defend amphibious forces ashore at night was a crucial innovation, whose value had been proven and would be again in the future. There was a price

however, the memory of the 20 men in the squadron who had died in the Solomons.

While it was temporarily disbanded, VMF(N)-531 nevertheless had brought home an Asiatic Pacific Campaign Streamer with four Bronze Stars for its operations in:

New Georgia	11 Sep - 16 Oct 43
Treasury-Bougainville	27 Oct - 15 Dec 43
Bismarck Archipelago	16 Dec - 1 May 44
Northern Solomons	13 May - 9 Aug 44

On 13 October 1944, the squadron was reformed with Lieutenant Colonel Radford C. West as commanding officer and Captain James H. Wehmer as adjutant. The status for the time being was "replacement training squadron." The 9th Marine Aircraft Wing (MAW) at Cherry Point had directed MAG-53—including the squadron—to move to MCAS Eagle Mountain Lake, Texas, on 29 November. Harshberger, as the new commanding officer of parent Marine Night Fighter Group 53, would be able to keep an eye on his former unit.

Four officers and 237 men were joined from the group, in addition to the seven personnel already on board. Lieutenant Colonel West was detached for overseas duty on 11 November and was succeeded by Major Edward V. Mendenhall,



Department of Defense Photo (USMC) A135007

*This F7F-3 Tigercat was on a training flight from Cherry Point in April 1950.*

Jr., who in turn departed six days later. Thus, Captain Finch found himself once again "temporary" commanding officer.

On 14 December, seven Douglas SBD-5 Dauntless dive bombers joined the squadron. The real purpose of the SBDs was as target bogies for the United States' newest operational fighter, the Grumman F7F-2N Tigercat twin-engine night fighter.\* VMF(N)-531 would be the first squadron to fly the hot, new plane.

How the Tigercat became a Marine night fighter was another familiar story of the Corps acquiring unwanted Navy airplanes. The F7F was originally designed to be flown from the new 45,000 ton Midway-class carriers. However, the problem of landing it with an engine out on the deck of a carrier proved insurmountable, and it became surplus to the Navy's needs.

Here was the answer to Colonel Schwable's pleas for a capable twin-engine, twin crew night fighter! There were minor limitations, but most pilots found it exhilarating to fly—it could be looped with ease, and the danger of redline at 430 knots could be quickly exceeded in a slight dive if the pilot was not careful. The novel and very stable tricycle landing gear made the ground

loops of conventional tailwheel aircraft a thing of the past.

On 17 January 1945, the first F7F-2N was ferried in, followed by 13 more by the end of February. The radar system, a Navy set called APS-6, was new, more powerful, and much easier to interpret than the old set. The same radar was used in Marine Corps' single-seat night fighter, the Gruman F6F-3N and -5N Hellcat.

Because Marine aviation had expanded so quickly over the past three years, skilled technicians and experienced aviators were scarce. For this reason, all flight and maintenance operations in early 1945 were conducted at the group rather than squadron level. Thus, squadron identities tended to blur somewhat until the arrival on 24 February of the first large contingent of trained Tigercat pilots led by Major (later Lieutenant General) Robert P. Keller. In the next five weeks, 36 new warrant officer ROs would join VMF(N)-531, including Walter E. Tiedeman of Solomons fame. The Marine Corps had finally acknowledged the importance of the ROs' role by elevating them to warrant rank.

On 10 April, Major Keller assumed command of the squadron from Major Alfred N. Gordon, who had had it for a brief 25 days (such was the rapid changeovers of commanders in those days). He led a gunnery detachment to Beaumont, Texas, where the four 20mm wing guns were fired. Each pilot received a week of gunnery practice.

\*The F7F-2N was a very clean design built around two Pratt and Whitney R-2800-22W engines of 2,100 horsepower which gave a flashing 343 knots at sea level. Its initial climb rate was over 4,700 feet per minute and its service ceiling was near 41,000 feet.

The tempo of operations of this time was extremely high; in May alone, the pilots totaled 2,105 hours in 1,642 flights. Early reports from the Okinawa campaign spurred the squadron on, and it was believed by all that the final invasion of the Japanese home islands would require the greatest night fighter effort yet.

Combat looked more imminent when, on 9 June 1945, Major Keller led the first cadre of 140 personnel with 17 F7F-2N planes (and 12 SBDs) west to California. From there the detachment went on to Okinawa on 14 August, arriving in the wake of the nuclear attack on Hiroshima and Nagasaki a week earlier. Here the men took over the designation of VMF(N)-533, a night fighter squadron which had a record 35 victories during the Okinawa campaign. The next day, the Japanese ceased all hostilities, but -533 would fly patrols until the formal surrender on 2 September.

It then moved to Nan Yuan Airfield, Peiping, China, on 6 October as part of the occupation of North China. There it flew missions along the main rail lines—and was frequently fired upon—in an effort to bring security to the countryside. This was doomed by the rising civil war, and its last detachment left China on 1 May 1947.<sup>42</sup>

Back at Eagle Mountain Lake, Texas, once again as VMF(N)-531, the squadron continued its role as a training unit with Captain James H. Wehmer once more in command. Three F7F-3 day fighters were taken on board for evaluation in late June 1945, in preparation for the coming transition to the -3N night fighter version. V-J Day was celebrated with a two-day standdown on 15-16 August, but round-the-clock training then resumed unabated, with the squadron flying 1,229 hours in 940 sorties with 29 aircraft in the last month of the war, to get ready for the much improved two-seat F7F-3N.<sup>43</sup> The first of these new models to go to an operational squadron was delivered on 25 September to VMF(N)-531, followed by five more by the end of the month.

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\*This featured more powerful Pratt and Whitney R2800-34W engines, elimination of the .50-caliber nose guns, a larger vertical fin for better single-engine control, and a long-awaited, totally new—to the naval service at any rate—radar. The SCR-720, the outstanding AI radar of the war for aircraft interception, was a joint American-British development. It had good low altitude capability with ranges of 4-5 miles. At higher altitudes, a 12-mile range permitted skilled ROs to find a target head-on, and then swing around to its stern for final attack, thus lessening dependence on GCI for the crucial final vectors.

But the new equipment came just as the squadron which would use it was being radically downsized. Wehmer oversaw the first post-war demobilization on 3-4 October, as the Marine Corps adopted the Army “point” system to determine discharge dates. He was succeeded by Lieutenant Colonel Alfred N. Gordon as commanding officer on the 22d. Altogether 88 men would be discharged that month, and Gordon noted the “loss has been a severe blow, since many of the most experienced men are among those transferred. Very few replacements have been received.”

The squadron now began an inexorable decline to its nadir as the nation dismantled its military establishment. On 28 December, still another new commanding officer, Major Harold G. Schlendering, assumed command and had to oversee the continuing loss of men and planes as 1945 ended. Plans then had to be made for the skeleton squadron to move back to its birthplace, where it would remain, except for deployments, for the next 22 years.

#### *Postwar Survival at Cherry Point*

Arriving back at Cherry Point in February 1946, the remaining personnel of the squadron struggled on with training through the spring and summer. By 15 April, VMF(N)-531 had been pared to an even dozen F7F-3N planes.

Possibly to give Marine aviation more visibility, the squadron began participating in air shows; six Tigercats went to Birmingham, Alabama, on 31 May, and another three to Schenectady on 18 June. The visit to New York state was led by a colorful new commander, Major Joseph H. Reinburg, a Pacific fighter ace who had taken over on 7 June. At the popular Cleveland Air Races that September, he gave a dazzling solo airshow four days running, with loops off the deck, vertical rolls, split-S's and single engine slow rolls toward the dead engine—altogether a remarkable performance for a multi-engine aircraft.

Back at Cherry Point, Reinburg faced a disheartening requirement. He was forced to preside as the unit assumed “paper status” on 1 July with only himself, a clerk, and a dozen Tigercats. A massive reduction was taking place throughout the Marine Corps, but it was particularly acute in Marine aviation which shrunk remarkably from 145 squadrons in September 1944 to 27 tactical squadrons in June 1946.<sup>44</sup>

Colonel Paul A. Noel was a junior officer in -531 in those summer days of 1946. He still remembers the handicaps under which they worked:

MCAS Eagle Mountain Lake had been decommissioned and MAG-53 shifted to MCAS Cherry Point. Shortly thereafter NAS Vero Beach (center of night fighter operational training) ceased flight operations, and most of the Marine instructors and aviation maintenance personnel were transferred to VMF(N)-531 at Cherry Point.

The problem was how to keep the aviators occupied when there was a shortage of flight hours available. This was solved by dividing the company-grade officers into three "wings" and rotating daily duties. One group was on the flight schedule, day and/or night; one group worked at their secondary ground assignments; and the third group was assigned to the "bull gang."

I remember setting up bunks in the enlisted barracks, moving furniture in the squadron offices, and most vividly cutting grass with a push lawnmower next to public works personnel on a rider mower. I think we wore flight suits, but it may have been dungarees. At any rate, in NC in June, July, and August it was *hot* and *miserable* duty. I also have a vivid memory of the senior captain, Henry A. McCartney, assigned in charge of the gangs, standing in the shade in spiffy khakis, as we were drenched in sweat.

In addition, each company grade officer had to turn in one correspondence course lesson per week minimum, for recording and mailing. These could be studied and prepared in the squadron area during normal work hours. Course subject was optional, but most of us enrolled in Marine Corps Schools, Quantico.<sup>45</sup>

On 1 November 1946, in spite of earlier problems, Reinburg set about rebuilding with 12 F7F-3Ns and 153 newly reported—and mostly fresh from boot camp—regulars in addition to two Reserve aviators. Flying was routine re-familiarization until 17 February 1947 when the squadron entered into formal "syllabus" training, including rocket firing for the first time on 11 March.

On 31 May, further consolidation of Marine

night fighters took place. MAG-53 was decommissioned. Its commanding officer had been Lieutenant Colonel Peter D. Lambrecht, previously the highly regarded combat skipper of VMF(N)-541 and one of the select group of officers who had been sent to Britain in 1943 to study English night fighting. He now became commanding officer of VMF(N)-531 on 1 June, bringing with him six F6F-5N Hellcats.

The Grumman F6Fs were earmarked for carrier duty for which they were well suited. The Hellcat was the easiest fighter of its day to fly, if not the fastest (228 knots at 23,400 feet), and it was very stable on instruments and during carrier approaches.<sup>46</sup> They would remain with the squadron until 4 September, while -531 was temporarily under the operational control of AirFMFLant.

In the meantime, the Marine Corps set about giving its night fighters some badly needed all-weather navigation capability. During the war, naval aviation had inexplicably lagged in the development of on-board navigation aids. The F7F-2N, for example, could not use radar beacons. Often a night fighter became completely dependent upon ground control radio for radar vectors to home base, even though those controllers sometimes lost radar and radio contact with aircraft. Now, however, the F7F-3N's radar had a provision for radar beacon reception. It worked up to 150 miles, depending upon altitude, and was quite reliable. But still better technology was on the way.

In May 1947, squadron pilots began training in a new type of blind approach system. It was called ground controlled approach (GCA) and used two scanning radar beams, one for glide-slope and one for runway alignment. The aircraft would be positioned in the beams and then "talked down" by the controller using a format that would not change for the next 40 years:

Love Tare Zero Three, this is your final controller, how do you read, over . . . . Check landing gear down, acknowledge, over . . . You are five miles from touchdown, approaching glidepath . . . begin descent. Slightly below . . . up and on glidepath . . . Slightly right of course, come port now to heading one three eight degrees . . . on glidepath . . . four miles to touchdown, on course, come starboard to one four two degrees . . . Cherry Point Tower clears

you to land . . . approaching minimums . . . at minimums, take over and land visually.<sup>47</sup>

By 1 July, 75 percent of the squadron's pilots were "GCA qualified," and they would soon be tested. The night fighting capability of the Corps, and VMF(N)-531 in particular, were evaluated in three formal intercept exercises, using GCI, beginning on 24 July 1947. In the first exercise, 17 raids were flown, resulting in only six "splashes." The second test was a high-altitude exercise of 12 raids. There were only two "splashes." The last exercise was at low altitude with eight raids and three "splashes."

While the squadron's performance was officially rated as "good," the percentage of missed intercepts was of great concern to the new commanding officer, Lieutenant Colonel Andrew G. Smith, Jr. Taking charge on 1 August, he saw that the student RO and GCI controller mistakes could be rectified by training, but there was no getting around limitations like radios with only ten channels. Even more worrisome was the lack of speed in the F7F-3N: only 210 knots at 20,000 feet. Bisson, a vital member of -531 during the war and the exercise evaluator, made the pithy observation, "If the night fighter . . . is slower than the expected . . . opposition, it remains of little value."<sup>48</sup>

In the fall of 1947, squadron pilots were getting in dive bombing practice just off Harkers Island, North Carolina. The target was located on a small sand spit. Years later, a story from -531's newsletter exemplified how rugged the F7F was:

On this occasion -531 Tigercats were dropping water-sand fills. Lt Foster rolled into his dive and as he started to pull out of his dive he found that the stick was frozen—no elevator control. After what seemed like eons in his dive toward the target and eternity, the stick suddenly moved and his Tigercat started to react and come out of the dive, but too late. However, the F7 mashed out, struck the target, and skipped back into the air.

The prop on one engine, badly bent, had to be feathered, but Foster was able to gain a little altitude and to fly single engine to a landing at Cherry Point.<sup>49</sup>

The days of planes like the F7F, however, would have to end when the United States took

note of the technological advances developed during World War II. Given the German's European successes in night fighter shootdowns using their jet planes, it was now clear that the United States needed a jet for such missions. Accordingly, the Bureau of Aeronautics issued a requirement for a carrier fighter able "to detect enemy aircraft 125 miles away, while flying at 40,000 feet and 500 mph."<sup>50</sup> Unfortunately, the Tigercats would have to carry on for seven long years before an aircraft reached the fleet that could even partially meet those specifications.

Lieutenant Colonel Smith oversaw the transfer of his squadron back to the 2d MAW at Cherry Point in October 1947.\* Then, in February and March of 1948, VMF(N)-531 participated in the first of the many Caribbean training exercises to come over the next 20 years. Six F7Fs were flown in stages to NAS Roosevelt Roads on the east coast of Puerto Rico. Once there, things went badly. The nighttime capabilities of the squadron were underused. One pilot was vectored aimlessly about without any navigation aids until he was thoroughly lost. He finally extricated himself in deteriorating visibility and "let down on the San Juan beam and flew back to base using radar." It was then discovered that the ship's radar was obsolete and in bad repair with a limited range. In fact, virtually every electronic system necessary for the night defense of the amphibious task force was unsatisfactory, a recipe for disaster in actual combat.<sup>51</sup> In years to come air defense of such task forces would be one of the knottiest problems facing Navy/Marine operations.

On 15 July, Lieutenant Nathan D. Post, Jr., reported in as the new commanding officer.\*\*

\*A story from a -531 reunion many years later could refer to any one of the three commanding officers who led the squadron in 1947 when the pilots were proud possessors of 13 F7F-3Ns: "One of them—the skipper's bird—was selected for refit with four bladed, reversible props . . . It seems the commanding officer became enamored with the tactical possibilities offered by taxiing backwards, an exercise ripe for a disaster of sorts. One such day, as -531's leader was practicing his newly discovered capability, he lingered in reverse a bit too long; the skitterish Tigercat picked up speed. Alertly, the Skipper jumped on the binder [brakes]. Alas, he'd forgotten about the tricycle [landing] gear; the bird sat back on its tail with catastrophic results. O&R [Overhaul and Repair] became custodian of the now-unusual airframe."

\*\*An later commander of -531 reported on squadron "sea stories" that told of Post staying very late at the Officers Club and "then getting up the following morning, bright-eyed and bushy-tailed, to the detriment of junior officers not fit to fly.

Then, in the fall of 1948, there was a change of terminology which marked the increasing recognition of radar's value in every adverse meteorological condition. Some squadrons were classed on 14 October as "all-weather" fighters. It was now VMF(AW)-531.

In 1949, fleet air defense was evidently taken to heart by the Navy. During another deployment to "Rosey Roads," -531 acted as part of a "Maneuver Enemy Fighter Aircraft Group." For eight days beginning 27 February, the squadron performed simulated daylight bombing, strafing, and rocket "attacks" on five separate Navy task forces, while escorting Navy patrol bombers, some of whom engaged in "atom bomb attacks." Significantly, no night attacks were scheduled.

The squadron, commanded as of 13 June by Lieutenant Colonel Joseph W. Kean, Jr., had its annual operational readiness inspection on 5-6 October 1949.\* Aircraft availability was 100 percent throughout, with only one radio and two radar failures. As part of the inspection, the first exercise was a simulated bomb and rocket attack against enemy troops at Camp Lejeune. The last exercise completed 53 hours of flying in 12 hours; it had been a grueling test.

On the eve of 1950, the concept of Marine all-weather and night fighters was well established. Five of the Corps' 12 active tactical squadrons were assigned that specialized mission. VMF(AW)s -531, -533, -144 were in MAG 24, and -542 and -513 were also VMF(AW) squadrons.

The first half of 1950 saw two major inspections; the first, an AirFMFLant material inspection found readiness to be "excellent," and -531 "ready for war within the minimum prescribed time."<sup>52</sup> The second was an unexpected Efficiency Trophy Inspection by the 2d MAW. The commanding general of the wing praised the unit for being "number one of all tactical squadrons inspected."<sup>53</sup>

As gratifying as this was to Lieutenant Colonel Kean, there were two large concerns for him and his successor, Major John R. Spooner, who arrived 16 June 1950. The first problem was a pilot turnover of 50 percent in the past six months. The second was a serious lack of trained airborne

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\*Also remembered in these tales was Kean "who persisted in carrying a swagger stick," and was called behind his back "Joe Kean, the model Marine." The accuracy of these "sea stories" cannot be vouched for, but they indicate that life in -531 could be colorful.

interception officers (AIOs), and this was compounded by manpower drains for routine base duties. Worse yet, designation as an AIO was deemed at the time to be an additional, rather than primary, military occupational specialty (MOS).

In April the burden of training AIOs was shifted to a formal AIO School at MAG-24, now designated an "All-Weather Group." The syllabus included ground school and flight hours, but for pilots and AIOs alike, the all-weather fighter trade was—and would remain—a very complex series of skills usually taking years, not months, to master. This would be reflected in -531's first serious accident to occur in more than four years.

The squadron's outstanding post-war safety record was marred during a cross-country flight on 21 June 1950, when Technical Sergeant Joseph J. Quinn led his wingman, Corporal Thomas E. Sims, Jr., into a thunderstorm.\* Shortly thereafter, Quinn saw his altimeter winding down below 300 feet and radioed a frantic warning for Sims to pull up. He then watched in horror as his wingman's Tigercat crashed into the ground killing Sims and his crewman.<sup>54</sup>

Four days later, the North Korean Army rolled across the 38th parallel into the Republic of Korea, and the Marine Corps found itself once again committed to combat. On 1 August—as the enemy noose was being tightened around the shrinking Pusan perimeter—the squadron was alerted for overseas duty and began packing and crating for embarkation. Three days later, the move was "postponed indefinitely." VMF(AW)-531 would not participate in combat in Korea.

While many former members of the squadron would play dramatic roles in Korea, -531 itself was reluctantly relegated to a training role, participating in large-scale exercises, and developing new night close air support (CAS) techniques. By December, 44 percent of all its enlisted men were recalled Reserves, and they had been completely integrated into the unit and were working at "a level of high efficiency." But the turnover of officers—mostly pilots being refreshed and sent to

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\*Enlisted pilots were called naval aviation pilots (NAPs). In this era, some NAPs had gone through flight training as enlisted men and others, such as former Aviation Cadets with Reserve commissions, accepted reversion to enlisted status to remain on active duty. Some NAPs accumulated well over 10,000 hours of flight time, two to three times as much as average commissioned pilots.

Korea—was so high that the squadron had to report that “a state of reorganization [existed] in nearly every department.”

A Navy/Marine exercise in November had -531 again defending the fleet—this time with much better results in communications. Ominously, however, attempts at dusk intercepts with “enemy” jets were not satisfactory. As Major Spooner stated, “Without complete air superiority . . . the F7F-3N . . . should be limited to missions during hours of darkness and . . . inclement weather.”

The early reports from Korea showed the need for adequate night close air support, but, as Colonel Schwable had discovered seven years earlier, there were severe obstacles to achieving it. The problem of target identification alone was daunting, but, beginning in 1951, two new approaches were tried.

The first involved precision ground tracking radar, operated by Marine Tactical Air Control Squadron 1 in Korea. The bomber was picked up in the narrow radar beam, over a visual checkpoint, at a precise altitude, and then vectored toward the target, whose location was plotted exactly. Given the number of variables, this radar could not assure the pin-point accuracy that true close air support required, but as a method for attacking larger target areas, it was excellent.<sup>55</sup>

A second technique practiced by -531 was ordnance delivery with night illumination. Flares were said to have had “remarkable results” in Korea, and the pilots found using them to be valuable training.

The squadron followed the Korean air war closely, in order to properly prepare its aircrews for combat. Reports from Korea showed that the night air defense mission was shifted aside while the night fighters provided close air support, beginning in September 1950 with the Inchon landing.

Night air defense again became important during the summer of 1951 when Russian-built biplanes began night harassing attacks. Two were shot down by Marine Tigercats, one on 1 July and another on 23 September. The AIO on the second was Master Sergeant Thomas H. Ullom, a former -531 RO in the Pacific who had returned to active duty and refreshed with the squadron at Cherry Point.<sup>56</sup>

VMF(AW)-531—now augmented by 10 F7F-3 non-radar fighter/bombers to go with its 14 F7F-

3Ns—worked hard to tailor its training to the needs of Korea, while meeting a heavy load of tactical exercise commitments. There were a dozen in 1951 alone. Certainly no other American aviation unit had such a diversity of missions.

One of these was a six-week deployment to the primitive Bogue airfield near Cherry Point, beginning 7 May. There the squadron practiced day and night rocket, gun, and bomb attacks, with emphasis on night close air support and use of flares. These night bomb and rocket attacks used ground radar in conjunction with GCI and AI radar intercepts. Sadly, on the night of 10 May, First Lieutenant Frederick M. Fahrion experienced a rough running left engine which failed shortly after a “wave-off” from landing at Bogue Field. The airplane crashed in a wooded area killing the pilot. The AIO escaped with minor injuries.

On 24 July, Major Fred J. Gilhuly became an interim commanding officer. His successor on 29 July, was Lieutenant Colonel Boyd C. McElhaney, Jr., who faced another aspect of the continuing night CAS problem. This emerged when the squadron flew in a joint air support weapons evaluation test at Fort Bragg, North Carolina. Air-ground coordination was initially reported to have been poor, and a debriefing of the pilots revealed that there were two non-Marine forward air controllers (FACs) for each mission, one on the ground and one in the flare plane. Neither could seem to agree on target location and designation, hence the confusion.

The test pointed out the crucial importance of FACs and pilots communicating effectively. The alternative was potential disaster when operating close to friendly troops. The Marine Corps had long understood this, and from the beginning had assigned aviators as FACs. Aviators not only spoke a common standardized language, but they also understood better than anyone else what was possible or not, thus helping ground commanders get the most from this unique supporting arm.

The year 1951 saw the last full year of F7F operations. The aging squadron Tigercats had flown an even 11,000 hours in 5,636 sorties (2,162 at night), with pilots averaging about 30 hours per month. Towards the end of the year, McElhaney began sending men off to technical schools to learn the secrets of the world’s first purpose-built, all-weather, jet fighter, the much-awaited Douglas F3D-2 Skyknight.

### *Enter the Jets: The Skyknight*

The F3D, affectionately known as "Willie the Whale," was a conservative design suitable for use on carriers, and featured the largest radar (the APQ-36) ever put in a fighter. It was an aircraft with immaculate handling qualities, featuring hydraulically boosted ailerons and spoilers for high speed roll control, and "speed retarder brakes" (or panels) which could be extended out of the fuselage to help slow down the plane when making an approach for a carrier landing.<sup>57</sup>

On 12 February 1952, Major Lowell D. Grow took over as commanding officer and accepted the first Skyknight, an F3D-1 of the first production batch, on 28 February. This was followed by three more by April. A single F3D-2 was delivered in May, and this would be the model operated in the coming years. At year's end there would be 20 on board.

Aircrews promptly got busy familiarizing themselves with their new charges. The side-by-side cockpit was spacious and had the vital amenity of pressurization for high altitude flight, as well as air conditioning of sorts. Radio equipment was elaborate with ten channels of very high frequency, a receiver, identification friend or foe (IFF), a radio altimeter, radar beacon reception up to 200 miles, and a long-awaited radio-compass. The heart of the F3D was the complex weapons system which consisted of three separate radars.

One searched on a scope left and right and in broad elevation from down to up. A single target could be selectively tracked. This track-while-scan capability would prove to be very effective. Although the "desired" acquisition range of the radar against a bomber target was 125 miles, in practice airborne radar operators found maximum ranges to be little more than 20 miles. Even so, it was enough to operate independently of ground control on some types of escort missions.

For protection against stern attacks, a second radar radiated rearwards in a conical search pattern with a range of about two miles. When a tar-

get was detected, an appropriate rear quadrant warning light came on. The third radar set was the gun aiming radar for the pilot, which was activated when his radar operator tracked a target. A primitive "ballistics computer" produced an aiming dot on the scope inside of 4,000 yards and the pilot maneuvered that into crosshairs, firing his four nosemounted 20mm cannon when in range. It was now technically possible for the first time for a fighter to shoot down another aircraft sight unseen.

While transitioning to the Skyknights, -531 continued to churn out replacement aircrews for Korea at a steady rate during the first half of 1952.\* It also worked to develop day escort tactics for the Marine Corps' revolutionary new aviation asset, the helicopter, beginning in January. They settled onto a left-handed "racetrack" pattern in column on both sides, one thousand feet above the helo formation. This permitted optimum coverage of potential ground targets at all times, and the helicopter leader could be assured of getting fire on his target within seconds.

The squadron would be a prime supplier of aircrews to the Corps' sole remaining night squadron in Korea for the rest of that conflict. The successes of these pilots and radar operators there reflected the excellence of their home training. It would be in the night escort role that the Marine F3Ds unexpectedly showed great capability in Korea. USAF B-29s had been forced into night bomber "stream" tactics because of the Communist air defenses and MiG fighter plane attacks. On 3 November 1952, history's first jet-to-jet night kill was made by a former -531 team, and this was followed by another "alumni" kill five nights later. Then five more enemy planes were brought down in superbly coordinated and executed missions, and the Marines had reached the peak of the world's night fighter forces by demonstrating a remarkable capability: no bomber escorted by a Marine F3D was ever successfully attacked in Korea thereafter.<sup>58</sup>

Meanwhile, at Cherry Point on 1 December 1952, the Commandant assigned the squadron a new task: "to maintain capability to operate from aircraft carriers."<sup>59</sup> This would be the first such mission for Marine all-weather jets. To this end,

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\*The 3,400 pounds, thrust in each engine in the production version of the F3D-2 gave a top speed of 460 knots at sea level. With drop tanks, the speed dropped 25-40 knots. Maximum ceiling ranged from 35,000 to 45,000 feet, depending upon weight. Low power made for tense takeoffs on the short runways of the day, however. Even a moderately loaded F3D needed more than a mile of pavement to get airborne on a summer day at 86 degrees.

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<sup>57</sup>Similarly, there was a succession of short-tenure commanders from January 1952 to July 1953: Lieutenant Colonel Gelon H. Doswell; Major Lowell D. Grow; and Major Arthur R. Boag.



Photo courtesy of Col Robert Foxworth, USMC

*This F3D-2 Skynight was the personal plane of the squadron commander, LtCol Gordon E. Gray, in late 1957. The folded wings were designed for carrier duty, but the plane proved unsuitable for that use.*

two pilots, Captains William J. A. Barbanes and William L. Hall, were sent to a Navy squadron to conduct field carrier landing practice. There, on 2-6 March 1953, they became the first Marines to qualify for carrier operation in the F3D, landing on board the *Franklin D. Roosevelt* (CVB 42).

The two pilots discovered that there were serious problems with the Skyknight at sea. This was the era of the violent hydraulic catapult, the landing signals officer with his hard-to-see guidance paddles, and, above all, the straight carrier deck itself which allowed no possibility of a go-around or "wave-off," once the throttles were cut for landing. If the arresting wires were missed, a crash into a web barrier was inevitable. If a "wave-off" was not prompt—and the F3D's engines required up to 15 agonizing seconds to go from idle to 100 percent power—there was danger of imminent collision with aircraft parked forward on the flight deck.

Indeed, the F3D-1's poor showing in carrier suitability tests was the primary reason the Marine Corps received the Skyknight. There were too many problems in the plane for effective night carrier service: its shallow approach angle, its poor visibility for the pilot, and its radar equipment failures at sea.<sup>60</sup> At the time of the Korean

Armistice, on 27 July 1953, VMF(AW)-531 had 24 F3D-2s on board, flown by 35 pilots with 23 radar operators.

Twelve pilots and 16 men—mostly radar operators—had been sent to Korea by the end of June. Six former members of -531 returning from combat were presented Air Medals by the Commanding General, 2d MAW, Major General Clayton C. Jerome, on 27 June.

As had happened after World War II, the contingency focus of the squadron now reverted to Europe, as well as keeping the carrier mission alive. In late August, VMF(AW)-531 sent an F3D to the Naval Aviation Test Center at Patuxent River for a catapult test.

A new squadron commander, Lieutenant Colonel Ernest R. Hemingway, took charge on 30 July.\* It was obvious that, if Marine all-weather fighters were to be involved in Europe, there would have to be practice for transatlantic flight. The F3D-2 was suited for such a mission, with two engines, good navigation/communication aids, a range of about 1,400 nautical miles with its

\*Hemingway, as a major, had been commanding officer of -531 for two weeks in July 1946. Now, seven years later, he had returned.

two 150-gallon drop tanks, and crews experienced in instrument flying.

The projected route was the traditional North Atlantic one, by way of Goose Bay, Labrador, Greenland, Iceland and Scotland. The longest leg was only 888 miles, and each stop had good facilities with long runways, ground control equipment, and radio and radar beacons.

But problems would abort the planned flight of four -531 Skyknights at Goose Bay on 16-19 November, due to shortages of critical equipment for a winter-time trans-oceanic flight. Nonetheless, Hemingway felt "that mass flights to the European Theatre with F3D aircraft in winter are entirely feasible and practical [and] could be made under weather minimums somewhat less stringent than [USAF] Ferry Flights."<sup>61</sup>

The period after the Korean truce saw another massive drain of personnel, with 127 men being separated or discharged by year's end. But even after the armistice, VMF(N)-531 continued to send trained people to Korea and later Japan, including some seven pilots and 34 men in the last half of 1953, almost none of whom were replaced. One positive note occurred in the area of aircraft communications and navigation, as the end of 1953 saw the conversion of all F3Ds to a radically improved ultra high frequency (UHF) radio.<sup>\*62</sup>

The year 1954 brought a more immediate focus to the squadron. On 15 June, a new commanding officer, Lieutenant Colonel Roscoe C. Cline, Jr., took charge, and on 8 July he led -531's first Caribbean deployment with jets to Roosevelt Roads. This was a two-month stint involving MAG-24 and the 8th Marines. Although the unit would perform all manner of aviation tasks in the exercise, Cline's primary goal was to carry out live interceptions and cannon firing under completely blind conditions. As far as is known, this had never been done by any Marine squadron before, since gunnery traditionally had always been done visually.

Four daily flights of four F3Ds were scheduled, each to get four or five runs per sortie. The target was a standard gunnery "banner" with a radar

\*The old radio set with 10 separate crystals for 10 channels had become much too inflexible. The new ARC-27 used a synthesizing technique that gave 1,750 possible frequencies with 20 pre-selected for convenience. It was also possible simultaneously to guard the emergency frequency, and a homing adapter permitted the crew to track to any UHF transmitter.

reflector attached to several miles of cable towed by another F3D. Each fighter began its run head-on to the towing F3D. The radar operator acquired the target on his search scope, then "locked-on" the radar to the banner. He then gave the pilot, at the precise moment, a tight pursuit turn into the target. After the towing pilot gave clearance to fire, the hooded pilot now concentrated on his gun-laying radar scope, trying to keep the jittering aiming dot in the cross-hairs. As the range fell below 400-500 yards, he opened fire.

The task demanded so much precision that it took about four weeks to register the first hit. After that, each crew slowly worked up to one to three hits per flight. Even though an actual aircraft would be easier to hit with all four guns, it became obvious that firing completely blind was only a marginally practical procedure.<sup>\*\*63</sup>

The balance of the Skyknight years to mid-1958 were spent in fairly routine fashion at Cherry Point, enlivened by annual two-month deployments to NAS Roosevelt Roads, and, more frequently, two week deployments to NAS Key West.\* The latter involved much ground controlled training, culminating in periodic Air Defense Command/NORAD sponsored air-to-air weapons exercises.<sup>\*\*64</sup>

Outside of VMF(AW)-531, it was a time of great changes in air defense, and these would bring the squadron a dramatic new plane.

#### *Skyrays to WestPac*

The focus of U.S. military aviation in the 1950s was the development of offensive nuclear capability, and, correspondingly, the ability to defend against nuclear attack. The Marine Corps would do both.

The U.S. Navy realized its ship formations were vulnerable and embarked on its own line of air defense development. By 1956, it had three planes as its mainstay. Two were the McDonnell F3H-2N and -2M Demon. The third was of a

\*There was a succession of commanding officers during these years: Lieutenant Colonels Alexander M. Hearn, Walter W. Turner, and Donald S. Bush; Major Earl W. Johnson; followed on 20 August 1957 by Lieutenant Colonel Gordon E. Gray.

\*\*NORAD was the North American Air Defense system, an integrated Canadian-U.S. command established on 12 September 1957 with air defense the major U.S. component.

much more radical nature and would be the next VMF(AW)-531 all-weather fighter.

This was the Douglas F4D-1 Skyray, a graceful, tailless, delta-wing fighter designed to meet a challenging specification: climb to 40,000 feet within five minutes to intercept a bomber before it reached its target.\* On 25 February 1958, Lieutenant Colonel Gordon E. Gray was the first squadron pilot to transition to the Skyray. Like others to follow, he was very conscious that the "F4D was the hottest plane we had at the time."<sup>65</sup> Acceleration and climb were breathtaking. Without external stores, a clean "Ford" (as it was quickly dubbed) could be climbed initially at 540 knots at 70 degrees nose up angle. The climb requirement meant a thicker, less loaded wing; thus, level top speed was limited. Pitch and roll was done through unconventional "elevons," but the Skyray had none of the traditional flaps for reducing speed. Slow flight was helped by free moving, leading-edge slats.<sup>66</sup>

The fire control system with its Westinghouse APQ-50 radar was designed to use unguided 2.75-inch rockets. This was -531's first regular use of a single-seat aircraft, and the fire control system necessarily had to be simple to use (although its 600 vacuum tubes would be a maintenance headache). Single targets could be locked onto from up to 25 miles, but actual detection ranges were perhaps half that against another F4D. In theory, the system's analog computer would guide the pilot to a lead-collision firing position slightly forward of the target's beam. Then:

At the last instant, a few seconds before a midair collision (about 900-2,000 foot range), when catastrophe appeared inevitable and as the radar scope flashed collapsing circles . . . the pilot mashed a trigger, hurling [up to four 19 shot pods worth of] fiery rockets off ahead . . . however, if the pilot missed on any little angle, speed, or course adjustment, or if the radar was a wee bit out of alignment . . . the rockets would go all for hell and gone.<sup>67</sup>

With these limitations in the late 1950s, two dozen Navy and Marine squadrons would have to make do with F4Ds in this configuration.

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\*A prototype XF4D-1 had captured the world absolute speed record of 752.9 mph (642 knots) on 3 October 1953.

On the positive side, there were many other important innovations in the Skyray. The radar system was mounted on rails for a single, easy removal. One hundred percent oxygen was now required at all times and was provided via a five-liter liquid oxygen system. There were provisions for a partial pressure suit for flights above 50,000 feet where a pilot could die if pressurization was lost.

A selective identification feature was now incorporated into the plane's IFF set. The pilot could select any one of 64 discrete codes which were sent out in answer when his IFF was interrogated, and his unit and plane number could also be transmitted. The set was "turned on" for U.S.-based radars on 1 February 1959, and it was now possible for controllers instantly to identify individual cooperating aircraft.<sup>68</sup>

Possibly the best innovation from the pilots' perspective was a new Navy-developed navigation aid called TACAN.\* It gave a very accurate magnetic bearing, as well as distance, in a single system. Pilots, at last, had an instantaneous picture of their position, without having to resort to tedious calculations or confusing sound signals.

The engine was powerful, with 16,000 pounds of thrust on afterburner.\*\* Finally, there was a Martin-Baker ejection seat. Provided the pilot was above 120 knots and 50 feet altitude, pulling a D-ring between his legs initiated an automatic sequence of canopy release, seat firing by explosive charge (with a frequent concomitant compression fracture of the spine), and a parachute deployment.<sup>69</sup> It was a vast improvement over the F3D in which the crew had to collapse the pilot's seat, grab a bar, and swing out of a belly escape hatch.

By July, transition training was in full swing, using new F4D-1s fresh off the production line. After logging more than 48,000 hours in service with -531, the old F3D Skyknights departed in mid-year along with their radar operators. On 1 August, Gray was succeeded by Lieutenant Colonel (later Brigadier General) Henry W. Hise,

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\*TACAN (tactical air navigation) was a line-of-sight aid with 126 channels and a bearing accuracy of better than one degree. Distance was accurate to 600 feet at close ranges and within two percent at long range.

\*\*This generated additional thrust by injection of fuel just aft of the last turbine stage. In the Pratt and Whitney J57-P-8 engine, its use quadrupled fuel flow while increasing thrust from 10,200 pounds to 16,000 pounds.



Photo courtesy of Maj William Henson, USMC

*The distinctive wing shape of the F4D Skyray is prominent as a pilot of VMF(AW)-531 takes off from a carrier deck. The squadron had four "carquals" in less than two years: September 1959 to August 1961.*

who would lead the squadron for the next two years, including the first unit carrier qualifications and the first overseas deployment in 14 years. Hise was a veteran of the early Guadalcanal battles and had commanded six other squadrons, including three in combat. Confronted with the somewhat scary reputation of the F4D, he knew better than most "what had to be done to keep my pilots alive to fight in combat." He instituted a rigorous regimen of flight discipline: lots of night flying; practice instrument letdowns on every flight; mandatory field arrests using the new gear at night or in weather; and strict adherence to procedures.<sup>70</sup> His leadership paid off: there was not an aircraft accident or loss of a pilot in the first three years of Skyray operation, although there were some close calls. On at least two occasions, pilots had to make emergency landings on alternate fields that had runways technically much too short for the F4Ds.

The squadron worked up for its forthcoming 15-month deployment to the Western Pacific by mastering the complexities of single pilot all-weather interceptions, invariably using each other alternately as bogies under Marine ground control. The current emphasis on defense against nuclear air threats by Marine all-weather squadrons led to the near demise of attack missions. Perhaps only five percent of the flights were devoted to air-ground attack, all of it strafing and rocketry on target ranges. There was no close air support practice.

The squadron personnel departed Cherry Point (without aircraft) for California in late March 1959.

From there, they endured a marathon three-stop, 33-hour flight to Tokyo. Their final destination was NAS Atsugi, a former Imperial Japanese Navy Airfield 30 miles southwest of Tokyo. There -531 relieved VMF(AW)-115 of their spaces, equipment, and Skyrays after arriving on 21 April.<sup>71</sup>

The squadron almost immediately began standing the night and all-weather alert "hot-pad" for the air defense of Japan. For the first time -531 entered the missile age. In addition to cannon and rockets, the Atsugi Skyrays were fitted with a pair of Navy-designed heat-seeking AIM-9B Sidewinder missiles.\* This weapon was visually fired at about one-half to two-and-one-half miles range in the target's aft quadrant. Once the pilot determined he was within range (by radar or visually), he listened for a buzzy growl in his headphones. This meant the missile's seeker head had detected an infrared signal which hopefully was not that of the sun, clouds, or warm areas on the ground, all of which could confound proper guidance of these early Sidewinders.

Even with these limitations, the Sidewinder was a cheap (under \$5,000 each), reliable, easy-to-use weapon that was very effective against non-maneuvering targets. Most of the pilots felt it

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\*The Sidewinder was a simple, low-cost missile with twice the speed of sound (Mach 2). About nine feet long and five inches in diameter, the 165-pound missile homed onto the infrared exhaust emissions of the target's engines. Over the next four decades, it was destined to become the most successful air-to-air missile ever made. More than a dozen versions were produced by the U.S. and it was copied by the Soviet Union and China.



Department of Defense Photo (USMC) A182350

*A squadron Douglas F4D Skyray makes a "run-up" on the new aluminum planked expeditionary airfield during Operation Blue Star on Taiwan in 1960.*

was a distinct improvement over the unguided 2.75" rockets and 20mm guns.

In late September 1959, -531 deployed to NAF Naha on Okinawa for its first unit carrier qualifications ("carquals") on aboard the *Lexington* (CV 16). Hise was particularly impressed with four innovations that had recently revolutionized jet carrier operations and reduced the accident rate by over half: the powerful and smooth steam catapult; the angled-deck which allowed successful go-arounds if an arresting wire was missed in a "bolter" landing; the angle-of-attack indicator; and the mirror optical landing system.

Instead of a flat approach begun at 250 feet altitude, the Skyray started down from 600 feet on a fixed glide path that the pilot tracked by use of a reflected beam of light. To overcome the swept wing jets' poor low-speed handling and slow engine response from idle, the pilot flew the approach with power in a constant landing attitude—at 132-137 knots or about 1.17 times stalling speed—by using his angle-of-attack indicator rather than airspeed. The Skyray was flown firmly onto the deck without changing power, and this stabilized approach to touchdown

proved to be the key to successful carrier landings with high performance aircraft.<sup>72</sup>

Twenty-three of 24 squadron pilots would complete their day "carquals" of 10 landing traps each. This was followed in early October with live Sidewinder firings, and yet more "carquals" on the *Midway* (CVA 41) in December.

While there were numerous "hot pad" scrambles during that tour, the closest approach to a potentially hostile aircraft was by the squadron's executive officer, Major (later Colonel) Emmons S. Maloney.\* Unlike the USAF, Marine all-weather interceptors had no particular weather minimums to launch in, and Maloney later described the night of 19 December 1959:

It was atrocious weather, raining like hell, with cloud tops above 40,000 feet. We were called by the . . . GCI site to see if anyone would volunteer for a hot bogey track coming south out of Russia. I took off and got vectored. . . . I looked into my scope—and

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\*Maloney would later serve as temporary commanding officer of -531 from 30Jun-5Jul60.



2d MAW Photo, 616A

*Squadron pilots take time for rest and relaxation between missions at Cherry Point in the 1960s.*

to my complete surprise—there was a target at 80 miles range, by far the longest contact I had ever gotten on the Ford's radar. I closed down to 50 miles when it suddenly turned around. . . . I think he may have been alerted by his own GCI. We thought it must have been a "Badger" [the large twin-jet Tupelov 16 bomber] and he was at 30,000 feet.<sup>73</sup>

On 18 January 1960, VMF(AW)-531 deployed for training to NAS Cubi Point on Subic Bay in the Philippines, after a fuel stop at Kadena AFB on Okinawa. Then, on 12 March, the squadron flew to southern Taiwan to participate in a large amphibious exercise. This deployment involved a scenario with a brigade-sized Marine force reinforcing Chinese Nationalist forces after a hypothetical Chinese Communist assault of the Nationalist-held islands of Quemoy and Matsu located just off the mainland. The squadron lived under canvas in wet monsoon weather, and was visited by numerous dignitaries including Chiang Kai-shek, president of the Republic of China.

The highlight of the exercise was the erection, in only 48 hours, of a Short Airfield for Tactical Support (SATS), using a new type of aluminum

planking called AM-2. The Marine Corps had always been concerned about getting support for its fixed-wing planes closer to the battlefield without relying on carriers offshore. This had now led to the experimental SATS expeditionary airfield and the application of carrier operating principles such as arrested landings. Carrier practice paid off as Hise made the first arrested landing by a fighter on a SATS strip under a low ceiling on 26 March 1960. Takeoff was another matter, since there was as yet no catapult system. Only a lightly loaded F4D could get off (by using afterburner) in under 2,000 feet, the length of the first experimental matting.

As the Far East tour of 15 months without dependents drew to a close, one observer later remarked that during "significant fractions of any day in the week, the entire air defense capability of FECom [Far East Command] consisted of Hank Hise or one of his troops alone in a 'Ford' with a scope."<sup>74</sup>

On 5 July 1960, the VMF(AW)-531 colors were finally taken down at Atsugi, and all its members were dispersed to new assignments. The same day at Cherry Point, an all-new -531 was formed. For the third time in its history it was a start from scratch. The new commander, as of 6 July, would be Lieutenant Colonel George J. "Ripper" Collins, a night fighter veteran with two victories at Okinawa and a combat tour in Korea.\* Collins' task was to work the new squadron members up for another Far East deployment. Happily, they would be among the first to benefit from the Marine Corps' new 13-month "unaccompanied" tour policy. The old 15-month tours had strained nearly all marriages and ended some altogether.

Starting anew with untried personnel also put a strain on safety. The unit's first fatal accident in 10 years occurred on 4 October when First Lieutenant James C. Norton crashed four miles from the field, after a "routine ordnance training mission." Collins himself would be forced to eject instantly three months later when his Skyray exploded just after takeoff; his was the first squadron life to be saved by a Martin-Baker ejection seat.

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\*When he became commanding officer, he took his wife, Elaine Collins, on a tour of the base. In one of the hangers, the tails of the squadron's planes were being painted with its call letters, Echo Charlie, "EC." Elaine Collins thought for months her husband had been very romantic when he told her the initials were for her!

The training pace stepped up considerably on the night of the squadron's 18th birthday, 15 November, with a recall exercise that started a "round-the-clock" flight schedule. Captain James S. Gahagan recorded that "the boom of our afterburners was heard well into the small hours of the morning, as we crammed sorties into every hour of the day and night. The harder we worked, the greater our unity and oneness of purpose became."<sup>75</sup>

Perhaps mindful of his own recent ejection and near miss with death in the icy waters of the Neuse River, Collins had all his pilots undergo the ordeal of "poopy suit drill" in the same estuarial river. The rubber anti-exposure suits were uncomfortable to wear and could be debilitating without ventilation, but they had proven to be lifesavers in winter water survival situations.

By 20 March 1961, 18 pilots had qualified for their F4D all-weather fighter pilot MOS. Training was capped with "carquals" on board the small deck of the venerable *Intrepid* (CVA 11), where 31 officers and 122 men embarked on 21-26 April.

Another Collins-inspired exercise was night live missile firings of Sidewinders. Mindful of his own wartime experiences, Collins knew of the importance of having his young pilots actually experience the sensation of firing their weapons at night. The operations officer, Major (later major general) William B. Fleming, later recalled how it was done. A target was towed by a tractor F4D and reeled out on 18,500 feet of thin cable. The shooter aircraft was vectored head-on to the tractor, and then took over the intercept from ground control inside of about 20 miles range. The pilot then maneuvered to maintain a 110-120 degree lead-collision bearing. At 12 miles and when two targets were clearly seen on the radar, the interceptor converted to a stern Sidewinder attack on the target.<sup>76</sup>

On 19 June, with a new commanding officer, Lieutenant Colonel John N. Swartley, VMF(AW)-531 departed for NAS Atsugi where it once again took over VMF(AW)-115's spaces and aircraft on 1 July 1961. Simultaneously, Collins returned to take command.

The next 12 months would be a reprise of the previous two years. There were more "carquals" beginning on 13 August from NAF Naha, Okinawa, on board the *Hancock* (CVA 19). In September and October, the squadron matched wits electronically at MCAS Iwakuni, Japan, with the electronic countermeasures operators of

Marine Composite Reconnaissance Squadron (VMCJ) 1. The goal was to be able to carry out successful interceptions against a target which could spoof its radar image using a variety of deception techniques.

In November there were joint air defense exercises with the Fifth Air Force, and 1961 was rounded off in December with three weeks of air-to-air ordnance qualifications out of Okinawa. At year's end, -531 pilots had accumulated from 312 to 632 hours in the F4D, and the least experienced lieutenant had 749 total flight hours. They were now fully qualified in all of the squadron's assigned missions, and squadron members spent the balance of the deployment honing their skills at a variety of locations.

After operating from Iwakuni in January 1962, the tour's closest support yet of an amphibious operation began on 12 March. The squadron's men and materiel were loaded on board the *Okanogan* (APA 220) and the *Union* (AKA 106), bound for field exercises out of NAS Cubi Point in the Philippines. This included a full scale administrative landing, living and operating out of tents, carrier re-qualifications on the *Midway* (CVA 41), night missile firings against targets towed by Navy jets, and jungle survival training in the nearby dense forests with Negrito mountain tribesmen.

The squadron returned to Atsugi on 22 April and continued practice with ground controllers, moved again at Iwakuni in May, and then flew in an anti-air warfare exercise in June. There VMF(AW)-531 flew its last sorties in the F4D-1 Skyray.

On 1 July 1962, tactical and administrative control was passed to MAG-24 at Cherry Point, and members of the squadron headed back home for reassignment. The two-year work-up and deployment period had been very successful; indeed, it had been an archetypical Western Pacific (WestPac) cycle for a Marine squadron of the pre-Vietnam era.

For VMF(AW)-531, the four-year Skyray era was a brief one. All-weather fighter design had moved rapidly in the 1950s, and the Ford's lack of a usable aerial refueling system to use with the KC-130F tanker plane then coming into service, minimal air-ground capability, and its inability to shoot down aircraft head-on doomed it to a short service life in the Marine Corps. Moreover, the all-weather mission itself placed extremely high demands on the single pilot who had to fly on instruments at sonic speeds, while simultaneously

operating and interpreting a radar scope. It was time for a new, more versatile plane.

#### *Phantoms and MiGs Over the Florida Straits*

As the last VMF(AW)-531 Skyray flights were being flown in Japan, training was underway for a new generation of the squadron's pilots in the F4H-1 Phantom II at NAS Oceana, Virginia. The Skyray's successor, the Phantom, would become the preeminent fighter attack aircraft of its generation, and would remain with -531 for more than 20 years. And, during these years, the squadron would be increasingly referred to by its nickname: the Grey Ghosts.\*

The first squadron pilot to fly the Phantom was the senior officer of the first cadre which would form the future -531 squadron. He was then-Captain (later Lieutenant General) Keith A. Smith, a Reserve officer on extended active duty and former Korean-era AD-5 Skyraider pilot. After a half dozen simulator flights in a trainer, he was checked out on 28 March 1962 in the world's fastest operational fighter.\*\*<sup>77</sup>

The angular Phantom with its bent-up wing tips, bent-down stabilators, and squeezed-in fuselage could hardly be termed esthetic, but these features were necessary to achieve stable flight at better than mach two. This speed was due to the thrust of two General Electric J79-8 engines of 17,000 pounds thrust each with four-stage afterburning. All primary flight controls were powered directly by hydraulics and control feel had to be artificially produced. The Phantom was dynamically unstable in pitch above about 300 knots, so an electronic stability augmentation system was also necessary.

McDonnell had designed the Phantom II as a very high speed, fleet area defense interceptor, carrying six Sparrow radar-homing missiles that could engage targets head-on up to 10 miles away. The plane's weapons system known as AERO-1A used state-of-the-art technology centered on a powerful APQ-72 Westinghouse radar with an analog attack computer—all run by a rear cockpit crewmember designated as the radar

intercept officer (RIO), who wore the wings of a naval aviation observer.

About half of the squadron's RIOs were former F3D radar operators, all warrant or limited-duty officers; the rest were brand new warrant officers from various aviation fields who had gone through rigorous training. After 17 weeks at Quantico for basic courses and warrant officer screening, they had received four weeks of pre-flight training at Pensacola; then a 16-week naval aviation observer course; and finally a nine-week practical application course at NAS Glynco, Georgia.

The flight training of Smith's cadre at Oceana included radar intercepts, as well as day and night carrier qualifications, but no air-ground work since no ordnance racks were then available. For radar intercepts, acquisition ranges at medium and high altitudes were the highest ever achieved by a fighter to date; 50-mile contacts against fighters and 75 against bombers were not unusual. Against very high altitude targets, intercepts could be made at 63,000 feet and higher. After the target was locked on, the attack computer constantly calculated closure rate and missile range. A separate transmitter in the nose of the Phantom "illuminated" the target, and the reflected waves were what the Sparrows homed onto. Once the complex Sparrow was in service, however, it was realized that a simpler alternative weapon would be necessary, and four Sidewinder missiles were then installed on rails above the wing Sparrow stations.

After 1 August 1962, the production F-4B began to be delivered from the factory to Cherry Point.\* With an El Toro squadron, VMF(AW)-531 was the Corps' first Phantom operator.

The maintenance side of training was overseen by Captain Robert P. "Ole Gray Fox" O'Neal, who would remain with the unit for the next six years. Along with Captain Smith, these two were primarily responsible for introducing a new computerized system for the more efficient coordination of personnel and maintenance operations. They also processed through the squadron a number of F4s for delivery to the USAF. This may have been the first time that Marines supplied the U.S. Air Force with planes.

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\*See Appendix H.

\*\*The F4H-1 then held numerous world's records, including those for absolute speed of 1,606.3 mph, maximum sea-level speed of 902.8 mph, maximum sustained altitude of 66,443 feet, and time-to-climb from start to 49,212 feet in 114.5 seconds.

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\*Naval aircraft designations were changed in late 1962 to conform with the USAF system. The F4H-1 became the F-4A. The production version first operated by VMF(AW)-531 was the F-4B.

O'Neal and Smith soon realized that the Phantom was the most labor-intensive aircraft that had ever been in Marine Corps inventory. This also troubled the new commander of the Grey Ghosts, who had taken over on 15 July 1962. Lieutenant Colonel Robert F. "Foxy" Foxworth, a former Royal Canadian Air Force sergeant pilot and Marine aviator in two wars, would now lead -531 into a very exciting period.<sup>78</sup>

He discovered it took some 60-90 maintenance man-hours to produce one flight hour. One example was the fact that flight above 50,000 feet required a full pressure space suit for life support. This necessitated a specially trained crew to maintain it. The aircrews themselves needed a week of training in the suit, culminating in a solo ride in a special low-pressure chamber which was explosively decompressed to 72,000 feet. A beaker of red-colored water that had been placed in front of the crewmember immediately went into a boil, presumably to remind him of what would happen to his organs if the suit failed. The hapless pilot or RIO inside looked out at faces pressed against the outside viewing ports, and his invariable thought was: this must be what dying in a gas chamber is like.

The first squadron pilots qualified in the F-4 on 25 September 1962, in a time of increasing military tension. Events were now developing into what would become known as the Cuban Missile Crisis. The Soviet Union had supplied Castro with surface-to-air missiles, some 40 MiG-15s and -17s, 42 Mach 2 MiG-21 fighters armed with Sidewinder copies, and 42 unassembled Il-28 medium jet bombers.

A series of daring reconnaissance flights in August-October uncovered the gravest threat of all: nuclear-capable ballistic missiles supported by some of the 22,000 Soviet troops and technicians believed to be in Cuba. On 22 October, President John F. Kennedy decided on a "quarantine" blockade. The strains between the two greatest powers on earth were now at the highest in history. Finally, after dramatic negotiations, 42 ballistic missiles were removed to the USSR on 11 November, followed shortly by 42 Il-28s. Kennedy then ended the quarantine, but tension would persist well into 1963.

In November 1962, Foxworth welcomed on board an all-weather crew from the Royal Air Force, Flight Lieutenants James Sawyer and Ian B. Hamilton. They were carrying on the more-or-

less continuous tradition begun by the original -531 squadron in 1943 of having a Marine and RAF night and all-weather crew on exchange duty. At least two pilots from -531 had been on RAF duty themselves.

Shortly after Foxworth greeted the visitors, he was forced to eject from his Phantom when it went out of control with a complete electrical failure. With the loss of power, a wild series of oscillations ensued. He and his RIO, Captain Daniel J. Benn, finally ejected. Benn was wearing his pressure suit when he came to earth in rural North Carolina. He trudged to a farmhouse in his space suit and inquired where he might be. The incredulous inhabitant replied, "Why, man, you're in the United States of America!" Foxworth, meanwhile, landed with a broken leg.<sup>79</sup>

In the continuing tension with Castro in 1963, NORAD found itself in difficulty. It had to try to cope with a tactical jet threat from Cuba, and the Air Defense Command had planned to rely on F-102 and F-104 aircraft for the mission. Unfortunately, the F-104 was basically a high-speed, day, clear-air-mass interceptor, while the F-102's radar missiles had neither much range nor maneuvering ability against a MiG threat.<sup>80</sup> Into this breach was placed an unproven squadron in an unproven aircraft: VMF(AW)-531 with its 18 Sparrow and Sidewinder-equipped F4Bs.

Foxworth led his squadron to NAS Key West (only 100 miles from Havana) on 22-23 January 1963, relieving part of an F-104 squadron. They would be vectored by a USAF aircraft control and warning squadron—call sign "Brownstone"—also based at Key West. No firing of weapons was permitted unless fired upon or specifically authorized by ground controllers.

The crews were divided into three flights. The first 24-hour block was spent on alert, the second was for training missions, and the third day was free. Normally, the primary alert crew could be airborne within 150 seconds after the alarm bell rang. The usual weapons configuration of the aircraft was two Sidewinders, two Sparrows, with no other external tanks or stores. This meant the pilots could operate to the full limits of the airframe of 750 knots, 2.1 Mach.<sup>81</sup>

There would be many scrambles, practice and real. Most of the former were off-course airliners and private planes. Some were against hostile aircraft. On 20 February, Captain Robert J. "Smoke" Divoky, a 21-year Marine veteran and former

enlisted pilot, and his RIO, Chief Warrant Officer Zac C. Tomlin, were scrambled and vectored south.\* He was followed by his wingman, Captain Ray L. Hanle with Chief Warrant Officer Frank H. Schwarz, Jr., who settled into a trail position. Tomlin got a radar contact which developed into a MiG-15 and a MiG-17. The USAF "Brownstone" controller instructed Divoky to escort the MiGs southward. As Divoky corralled the two MiGs, who appeared to be setting up in a race-track attack pattern, Hanle closed in and spotted two more brownish MiG-15s rolling onto his own rear. Schwarz—who up to that time had not seen much air combat maneuvering performed—quickly exclaimed to Hanle, "Do some of that pilot "stuff!" Hanle, reacting quickly, lit his afterburners and broke hard right into the pair, passing them canopy-to-canopy. The MiGs failed to counter aggressively, and Hanle then ruddered around onto their tails into firing position with Sparrows tuned and "Sidewinders growling."<sup>82</sup>

Now Hanle's MiGs dipped, and he saw bright flashes of fire and smoke as they fired their cannons.\*\* Thinking they were firing on Divoky, Hanle barked out a radio call to "Brownstone" which calmly instructed him to hold his fire while a decision was bucked up the chain of command. Now Divoky picked up yet another fighter—a silver MiG-17—off to Hanle's right, and he turned to defend his wingman by engaging that MiG-17 in a scissors move. The criss-crossing scissors should have favored the nimble MiG, but Divoky, as a 43-year old veteran pilot, masterfully worked his Phantom to the limit. At the third reversal, the MiG-17 stalled and began to spin down.

The Marines could not tell if it crashed or not, but Hanle now noticed that the object of the MiGs' attack was a shrimp boat dead in the water, and Divoky reported large splashes pocketing the water about the vessel. With their attack thwarted and being in imminent danger of having Marine Sidewinders fired up their tailpipes, the MiGs now turned away southwards. Despite the unmistakably hostile nature of the attacks by the MiGs in international waters, it took several long

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\*Both Divoky and Tomlin were Korean-era F7F and F3D veterans of -531.

\*\*The MiG-15s and -17s were equipped with three cannons each: two 23mm and one huge 37mm. Both were subsonic at about .88 Mach with a maximum low altitude speed in the 450-500 knot range, but they had exceptional turning rates and high ceilings of up to 55,000 feet.

minutes for the final decision to be made on the ground. It must have seemed like an eternity to the crews as they swirled around with the MiGs, but the decision was; "Do not fire!"

Divoky and Hanle then circled the boat, as more -531 flight sections raced in, followed by Navy F-8 Crusaders, but it was all over. Both crews felt cheated of victories, but they were reassured shortly after landing by a phone call from General Maxwell D. Taylor, Chairman of the Joint Chiefs of Staff, who commended them for their forbearance in not shooting. There was also a call from the presidential press secretary to confirm that they had fired no weapons. He asked the pilots to make no statements but to keep their eyes on the newspapers.<sup>83</sup> The next day the squadron read that President Kennedy had been outraged by the MiG attack on a disabled boat.\* One newspaper headline read, "Next Time Shoot, JFK Says."<sup>84</sup>

Despite the lack of formal air combat maneuvering training in the Phantom, both crews and aircraft had responded very well in an outnumbered situation with two of them versus five opponents in this first F-4 versus MiG engagement. There were more to come. On 7 March, Divoky and Tomlin were scrambled again, this time against a "hot track" which originated from Cuba. Divoky's wingman was forced to abort, and "Brownstone" ordered the now solo F-4B to go "gate at angels 35" (maximum power to 35,000 feet). Tomlin got a radar contact just as Divoky spotted the fastest moving contrail that he had ever seen. It seemed impossible to attempt an intercept with a 2,000-knot closure rate between the two planes. But then Divoky and Tomlin got sucked behind the collision bearing, to wind up one and one-half miles in trail of the bogey.

Divoky worked his speed up to nearly Mach 1.8 to close with a grayish fighter with red Cuban markings doing Mach 1.6 at 35-36,000 feet. It was the Soviet bloc's fastest aircraft, a MiG-21 about whose actual performance very little was then known.\*\* Despite being sometimes over Cuba, "Brownstone" instructed Divoky to continue. One reason may have been that his RIO carried a

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\*A grateful shrimp company sent -531 a bushel of huge golden shrimp.

\*\*The MiG-21F-13 carried one 30mm cannon and two Sidewinder-type K-13 (R-3S) missiles. A single Tumansky R-11 F-300 engine gave it a top speed of about Mach 1.8 at altitude and about 620 knots at low altitudes.

government-issued Leica camera, and here was a rare opportunity for a close-up photo.

Improbably, the MiG-21 pilot at first seemed unaware of the Marines' presence as they flew close together at Mach 1.6. After Tomlin snapped the MiG's underside, Divoky flew up along the left side, and then rolled upside down canopy-to-canopy, while Tomlin got a remarkable plan view shot while "hanging from his straps." The MiG then went to Havana, while Divoky and Tomlin scooted home with valuable film. The intelligence officers professed to be delighted.

Another scramble came some weeks later when a bogey was detected. Captain (later Major General) Michael P. "Lancer" Sullivan, recently returned from duty with the RAF in England, and his RIO, Chief Warrant Officer Charles C. Taylor, along with his wingman, First Lieutenant James D. Gilliard, roared off in poor weather and found themselves tail-chasing a target. By using their afterburners, they quickly accelerated to Mach 1.1 (about 740 knots) at 800 feet altitude. Ground control had just cleared the flight to fire, using new streamlined rules of engagement, when their radio began fading. Sullivan sent Gilliard higher to regain communication, while he pursued a bogey Taylor had acquired on his scope at 10 miles distance. At less than a mile and with a dangerous overtaking speed of 470 knots, Sullivan came up on two MiG-17s, and, to avoid disaster, he was forced to roll around them with the plane's speed-brakes out and his throttles at idle. At that point, Gilliard relayed further ground instructions to hold fire now and remain five miles in trail.

As he rolled out astern of the MiGs, Sullivan noted that the MiG wingman "was wobbling around like a flight student." He then concluded that the MiG intrusion was a training flight gone astray from a base near Havana. The MiG-17s waffled home, apparently oblivious to the fact they had nearly become the first Marine aerial victories in a decade. Sullivan turned his flight for home, staying low to avoid the surface-to-air missile threat, and landed 22 minutes after takeoff.<sup>85</sup>

Sometimes the intercepts of Soviet-made aircraft were more benign. Hanle recalled being scrambled to escort a northbound Ilyushin 18 to the Key West municipal airport during May, as tensions slowly wound down. He thought it had something to do with the forthcoming Bay of Pigs prisoner exchange.<sup>86</sup>

Presumably, the corresponding flights to that one were the ones that then-Major Orey E. Cory

later remembered when "Brownstone" called for a highly classified mission by four aircraft. The mission was of such a sensitive nature that flight crews were not to be briefed. As the flight leader, he was personally informed at "Brownstone's" Center. The mission involved escorting a passenger aircraft to Havana, circling the Havana Airfield while personnel were offloaded and other personnel were loaded, then escorting the aircraft back to Key West. Cory described what happened next:

Although the Jeep trip back from "Brownstone" was fast, I was dismayed to see the planes launched by "Brownstone" before I had returned. But, not to worry, the mission, as all others, was executed by - 531 professionals. It was disturbing to be ordered to withhold disclosure of any details, even after completion of the mission, and then to read all about the prisoner exchange in the next morning's local newspaper.<sup>87</sup>

In between scrambles, training proceeded apace. One of the more dramatic exercises involved practice interceptions of high-flying Lockheed U-2 planes as they exited Cuban airspace. This required donning the Mark 4 pressure suit. After take-off, the Phantom would be climbed to 45-50,000 feet at .90 Mach, followed by a series of gentle dives to about 36,500 feet to build up speed near Mach 2. As the U-2 was acquired on radar, the RIO attempted to establish a pure head-on intercept. The F-4 was held at about 50,000 feet, and as Sparrow missile launch range approached, the pilot quickly pulled up the plane's nose to place it in a lead-collision firing attitude.

Sometimes, the pilot might have to recover from the unusual nose-high attitude caused by pulling up excessively. Thus, more than one pilot found himself nearly vertical or on his back above 65,000 feet, when his afterburners usually blew out and when his engines were prone to overheating or flameout.<sup>88</sup> Sometimes, -531 pilots found themselves as high as 82,000 feet. The only thing to do then was to neutralize the controls as the aircraft floated skyward or tail slid backwards, until enough air pressure was exerted on the controls for the aircraft's natural stability to take over and get it pointed in the proper downward direction.

First Lieutenant Wesley D. Johnson recalled that there was more to the squadron's activities than flying:

The squadron's reputation was negatively enhanced, and its history embellished, by a feisty group of ground personnel. Morale was extremely high, matched by the outstanding performance of all hands. The proficiency of one group in applying stenciled Grey Ghosts to just about any object not in motion gave the troops plenty of laughs, and gave command plenty of headaches. The Grey Ghost appeared on a submarine at the naval station, on other squadrons' aircraft, including a Grey Ghosted Blue Angel plane. Skipper Foxworth can attest to the fact that the squadron was eventually prohibited from displaying the -531 insignia in any fashion.<sup>89</sup>

After having spent five months on the hottest "alert pad" of any American interceptor squadron, the tour now came to an end. The performance of -531 at Key West had been beyond all expectation, and a plaque signed by Major General Thomas J. Gent, Jr., USAF, Commander, 32d NORAD Region, was given to the squadron. It read: "To the Officers and Men of VMF(AW)-531 for outstanding contributions to the defense of the United States during the period 1 February 1963 to 15 June 1963." In addition, a commendatory letter from General Gent was placed in each squadron member's record.

#### *Phantoms to WestPac*

The Grey Ghosts redeployed home to Cherry Point on 15 June 1963, and then on 2 July Foxworth was formally relieved by Lieutenant Colonel William C. "Quick Draw" McGraw, Jr., a former test pilot who held several current world's records in the Phantom. The warm and gentlemanly Foxworth had seen the Ghosts through the critical formative stages, including a flawless deployment in near-combat conditions to Key West. In addition, in the 1963 2d Marine Aircraft Wing competitive evaluation exercises, -531 was awarded the Commanding General's trophy for the highest overall score of any squadron. "Top Gun" awards went to six individual Ghosts.

McGraw would now lead the squadron for the next two years through its first unit carrier qualifi-

cations with the Phantom, then on to WestPac and the Ghosts' first combat tour in 21 years. The officers and men he commanded would, for the most part, serve together continuously for an unprecedented 39 months. Such stability would give -531 a high degree of cohesion, mission proficiency, and a strong sense of unity.

On 1 August 1963, the squadron was redesignated Marine Fighter Attack Squadron 531 (VMFA-531). Although the primary mission remained "to intercept and destroy enemy aircraft and missiles under all weather conditions," there was now a secondary mission assigned: "to attack and destroy surface targets and such other air operations as may be directed."<sup>90</sup> This would remain the mission of Marine Phantoms and the follow-on F/A-18 Hornets into the 1990s. For the moment, however, this new mission would remain theoretical, until conventional external ordnance racks were delivered in early 1964.

From November 1963 through February 1964, the squadron returned sizable detachments to man the U.S. Navy's "hot pad" in Key West. Tensions cooled during 1964, and so the focus shifted to training.

Sadly the squadron would also see its first fatal accident in four years. First Lieutenant Frederick A. Libkie and his warrant officer RIO, Kent D. Ashmore, were engaging in low-altitude day-intercept practice off Key West on 18 January 1964 when smoke was observed coming out of the engine. The aircraft settled down closer to the water, then pitched upward in a stall, and impacted upside down. The crew and aircraft were lost at sea.

In March, the squadron concentrated on field carrier landing practice in preparation for its first carrier work with the Phantom. From the 19th to the 24th, it operated on board the *Forrestal* (CVA 59) off the Virginia coast in adverse weather. All 22 pilot/RIO teams qualified with at least 10 traps and 10 catapult shots each, including some at night, plus two carrier controlled approaches (CCA).<sup>91</sup>

Although the F-4B approached the flight deck at speeds (132 to 138 knots) similar to the Skyray, pilots considered it a better carrier aircraft, primarily due to the rapid response of its large J79 engines. And, of course, the Phantom never lacked for power.

The carrier controlled system for landings was a talk down approach like the familiar ground controlled system. The pilot would position his



Photo courtesy of 1stLt Wesley Johnson, USMC

*An F-4B with 1stLt James D. "Diz" Gilliard and RIO, CWO-2 Wesley D. "Wes" Johnson, provides a very close escort for an Russian Tu-16 "Badger."*

plane at a "marshal point," usually on the reciprocal of the ship's course. At an exact time—and the desired standard was to the second—the pilot pushed over at 250 knots and at 4,000 feet per minute descent rate. He then reported his position, completed his landing checks, and reported again. The radar controller then gave him headings to align the aircraft with the angle deck, while the pilot descended at 500-700 feet per minute to arrive at one half mile to touchdown at 300 feet above sea level (or about 240 feet above the deck). Then he reported a final time.

The last seconds were flown visually under the watchful eye of the landing signal officer. After final adjustments to correct for line-up and a pitching deck, the pilot came on in. When he felt the jolt of the landing, he immediately mashed his throttles to full "military" power (maximum with-

out afterburner) for a "go-around" in case his hook skipped a wire.

If it all went well, the third of the four wires was snagged, and the 34,000 pound Phantom snaked to a smooth and sudden stop with engines roaring. Such was the challenge of all-weather naval aviation.\*<sup>92</sup>

The next two months of final training included day and night air-ground ordnance delivery. Bombing and rocketry was done using 30 degree dives from 7-8,000 feet, releasing at 3,000 feet,

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\*LtGen Keith Smith later recalled that a "saga unfolded one dark and stormy night as the [plane] recoveries got underway. After this one Phantom touched down, perhaps a little hot, an excited voice was heard to say, 'We're going off the end!' and a calm voice from the same Phantom replied, 'Relax! There's no sense dying all clutched up!'"

with a minimum pullout altitude of 1,500 feet. Napalm was released in low-altitude lay-down runs. Ordnance was carried on triple and six-store multiple ejector racks.

One feature of the Phantom became immediately obvious: it could carry an enormous ordnance load even on the hottest day—up to twenty-four 500-pound bombs (twice the load of the famed B-17 Flying Fortress in World War II!). Furthermore, it was very stable in dives, as the RIO assisted with call outs of dive angles, speeds, altitudes, and release calls. With practice, most pilots could get their bombing scores well inside 100 feet and, with rockets, perhaps half that.

On 16 June 1964, the squadron's 15 planes took off consecutively for a non-stop flight to MCAS El Toro, California, refueling enroute from Marine KC-130F fueler transports. This mass aerial refueling was excellent practice for the long ocean flight to come.

One of the first transpacific flights of Phantoms was set for 22-28 June. The route to be flown was rich in Marine aviation history: MCAS Kaneohe, Hawaii; over Midway Island; refueling at Wake; and on to NAS Atsugi, Japan. To be a successful movement, it would be necessary to overcome difficult circumstances that involved leapfrogging four cargo/transport and also eight tanker KC-130Fs to support the F-4B fighters.

Eleven F-4Bs departed El Toro on 22 June. They were followed by the remaining four the next day, as a provision to pick up any possible aborts. There were no aborts, which was a fine testimony to Captain O'Neal's maintenance effort. Refueling was conducted about a third of the way across, which gave a pilot the option to land in Hawaii or return to El Toro if he could not take on fuel. Refueling was done in level flight at about 200-205 knots at 20,000 feet, but this led to a higher than planned amount of fuel being transferred. This caused a problem because the maximum speed of the KC-130 was close to the stalling speed of an F-4B, and the Phantom then swallowed around trying to hang onto the refueling drogue. Another difficulty was that the extended refueling probe was just behind the pilot's head. The solution on later legs was to refuel the fighters only partially to keep them light and maneuverable, and top off just before drogue drop-off.

Another problem was that the KC-130's radio interrogator could only receive the F-4B's signal at about 60 miles, instead of the usual 150. Thus the

lead KC-130F's radar/radio operator had only a critically short time to position the tanker fleet, which was closing in on the fighters head-on at 14 miles per minute. This intercept-in-reverse involved a very precisely timed sweeping turn of the tankers, so that the descending Phantoms would arrive at the proper fueling position astern the tankers.

In a transoceanic flight like this, it was very strange that the F-4B was totally unequipped for long-range navigation. The aircrews had to use the same dead reckoning techniques that Lindbergh had used two generations earlier. Marine Phantom crews thought it a scandalous omission, noting that even the USAF—which did little overwater flying—had equipped its F-4s with inertial navigation systems that could reliably navigate a thousand miles or more with only a mile or two of error.

The Ghost fighters landed at Kaneohe with their fuel levels comfortably above the prescribed reserve of 10 percent. The flights had averaged only 4.8 hours enroute. Using the same leapfrog tactic, 11 F-4Bs left Hawaii on the 25th for the four-and-a-half-hour flight to Wake, refueling near Midway. The other four came on the next day. At Wake they learned of a threatening typhoon, so the next day all 15 hastily departed within two and a half hours. Happily, they were able to reach Atsugi and ended their long flight safely.

The carefully planned and precisely executed prototype F-4B "TransPac" had come off without a hitch to the credit of all concerned—a clear demonstration of the ability to deploy Phantoms halfway around the world. The flight would become the model for all subsequent such moves.<sup>93</sup>

The first Atsugi missions involved fighter cover for a naval task force operating in the Sea of Japan. This body of water is nearly landlocked by Japan, Korea, and Russia, and contained the Soviet Union's strategic Pacific naval base, Vladivostok. American naval activity in the Sea of Japan was of great interest to the Soviet Air Forces, as Captain George F. R. "Bob" Hanke recorded:

The Russians came through with daily overflights by Tu-16 Badgers, and in this caper we again proved our capability to provide around-the-clock availability and lightning intercepts. Camera-wielding RIOs brought back photographs that showed the

part in Ivan's hair and the rivets in his aircraft.<sup>94</sup>

The interest in photography was mutual. On the squadron's very first interception, First Lieutenant James D. Gilliard, his RIO, CWO-2 Wesley D. "Wes" Johnson, and a wingman closed in on a Russian Tu-16 Badger bomber, and the RIO of Gilliard's wingman took a famous photograph of the two planes that would later appear in magazines and was put up on officers' club walls. On a subsequent intercept, the irrepressible "Diz" Gilliard did indeed "ease the nose of his aircraft practically into the Badger's tail gunner's compartment, which caused the tail gunner to react in a very disturbed manner—probably fearing for his life!"

It was on yet another intercept of another "Badger" that Gilliard and Johnson pulled up very close to the Tu-16 and saw its tail-gunner raise a camera to photograph this newest plane in the Corps' arsenal. The Marines signaled him to wait, then flew in closer, removed their oxygen masks and visors and proceeded to mug shamelessly for the bemused Russian.<sup>95</sup>

On 31 July, Hanke and CWO Frank H. Schwarz, Jr., his RIO, would have a close brush with death. Taking off from Atsugi, their plane was climbing through 1,500 feet when both engines failed, and the F-4B began to fall rapidly. Unable to restart the engines, Hanke rapped the side of his canopy (in the standard signal to eject) and Schwarz got out, breaking his tailbone.

Hanke saw a city right under his nose and recalled a terrible incident earlier when a crippled Navy fighter had crashed into a factory near Atsugi, killing 14 persons. Without a second thought for his own safety, he now steered his Phantom away from the city. The turn used up precious airspeed and his plane began to stall. At 200 or 300 feet, with the aircraft wrapped in a vertical bank with a "huge sink rate," Hanke pulled his ejection handle and thought, "Oh hell, the seat didn't work!"

It did, but only barely. An explosive charge blew his seat out sideways, and his parachute was just opening as he struck the ground near his crashed Phantom. He suffered a compression neck and back fracture. For his courageous deci-

sion to stay with the aircraft, he was awarded the Navy and Marine Corps Medal.<sup>96</sup>

On 14 September, the Ghosts deployed to NAS Cubi Point for air-ground ordnance training and carrier qualifications on board the *Constellation* (CVA 64). After returning to Atsugi in November, they turned around and moved to Kadena Air Force Base, Okinawa, for a fire power demonstration for a delegation of dignitaries.

Most of the crews were cynical about such displays, but the Ghosts got to make a number of maximum ordnance load sorties carrying twenty-four 500-pound bombs each, and also work out some of the bugs in the large five-inch Zuni rockets. Both completely devastated the appointed target, and a highly pleased Commanding General, 1st MAW, Major General Paul J. Fontana, commended them for "a job well done by Marines!" Then, on 27 December, the squadron flew down again to Cubi for another month of training, including carrier qualifications on the *Ranger* (CVA 61), followed by a Sparrow missile "shoot" against small jet drones.

On 5 January 1965, Captain Ray L. Hanle and his RIO, Chief Warrant Officer David D. Fuller, had a close call on lift-off when their Phantom, loaded with bombs and rockets, pitched up unexpectedly, followed by an uncontrolled drop of the right wing. Fuller was able to eject with the plane in a vertical right bank with a 20 degree nose-up attitude; he suffered the usual compression fracture of the back. Hanle then tried to eject himself, but his seat failed to fire. So he began wrestling with his plane, nearly striking the Cubi Point Officers Club, and finally gaining control. A shaken Hanle got back safely on the ground, hoping his seat would not now decide to fire.<sup>97</sup>

Returning to Atsugi on 20 January, the squadron resumed air defense alerts, this time from a "hot pad" at nearby Yokota AFB under USAF control. Compared to Key West it was distinctly quiet duty until a foggy night on 19 February. The Hanke/Schwarz crew were scrambled to chase down, on top of the overcast, a USAF C-130 transport which was short on fuel and had lost all communication and navigation aids. Schwarz got Hanke rendezvoused by radar and motioned the Hercules pilot to follow, but the transport pilot did not understand standard fighter hand signals. Hanke flew as slowly as he dared, while the lumbering turboprop clung grimly onto his wing as they let down through the fog on GCA at Yokota. Down practically to zero feet,

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\*The Tupolev Tu-16 was a 150,000 lb, swept-wing bomber with two huge engines of 20,950 lbs thrust each.

they glimpsed the runway. The GCA controller had positioned the Phantom all right, but the C-130 was too far off to one side. Gingerly, the pair went around for another try. This one was successful, and the lives of all on board were saved. The USAF awarded Hanke a Distinguished Flying Cross and Schwarz the Air Medal for their fine efforts.<sup>98</sup>

### *Combat in Vietnam*

Although the WestPac tour had so far been routine, events had been unfolding in Southeast Asia which would ultimately involve the Grey Ghosts in combat for the first time in nearly 20 years.

Marines had become progressively more and more involved in Vietnam since arriving in 1962 as a helicopter task force and a contingent of advisers. In March 1965 a battalion landing team (BLT) was sent ashore at Da Nang, the principal city in the northern part of the Republic of Vietnam (RVN).

Speculation around the squadron reached high pitch in late March when Lieutenant General Victor H. Krulak, the commander of Fleet Marine Forces, Pacific, made an extended visit to Ghost spaces at Atsugi. The guess work ended on 10 April 1965, when Major General Paul J. Fontana telephoned McGraw and ordered him to deploy VMFA-531 to Da Nang.<sup>99</sup> It would be the first Phantom squadron in Vietnam.

Why was VMFA-531 selected to be first? At this early stage of the war, the air defense of American enclaves against the unknown attack capability of the fledgling Democratic Republic of Vietnam (DRV) Air Force was always in the minds of planners. Strikes from airfields in the North would be simple to launch, with the potential of disrupting ship-to-shore operations. The superior air-to-air and air-ground capability of the Ghost F-4Bs could deal conclusively with that problem. Finally, there was the strong desire of General Krulak that Marines be the "first to fight."<sup>100</sup>

Within three hours of receiving orders, four F-4Bs led by McGraw were airborne for a direct five-and-a-half-hour flight, using one aerial refueling southwest of Okinawa. Two hours later, all 11 other Ghost Phantoms had taken off for Vietnam, with fueling stops at Naha and Cubi. This immediate readiness was a tribute to the superior efforts of the Maintenance Department. Next, squadron personnel and equipment were loaded on 10 KC-130F Hercules, and they began



Department of Defense Photo (USMC) A185086

BGen Frederick J. Karch, left, is happy to see LtCol McGraw as he brings VMFA-531 into Da Nang—the first Marine fixed wing tactical squadron to arrive in Vietnam in 1965.

arriving at Da Nang throughout the night. (Another 71 men and the heavy gear had boarded the *Snohomish County* [LST 1126] earlier.)

After 700 miles of dead reckoning over the South China Sea on the last leg of the 2,500-mile flight, the lead crews were relieved to pick up the welcome signals of the Da Nang TACAN which led them to the airfield and the only jet-capable runway north of Saigon.

Da Nang was the headquarters of the I Corps Tactical Zone (ICTZ) and was only some 90 miles southeast of the Demilitarized Zone (DMZ). Fewer than 60 miles to the west was Laos with its collection of dirt roads and paths, known collectively as the Ho Chi Minh Trail, by which the indigenous enemy was supplied from the north.

All of the squadron's aircrews were acutely aware and proud that this was the first deployment of a Marine Corps jet squadron to a combat zone since the Korean War. Many also recognized that the missions they were likely to fly would be attack, rather than the interception role for which they had so assiduously trained. Nevertheless, to their credit, the Grey Ghosts would effectively pioneer most of the types of attack missions flown in Vietnam for which Marine air would become renowned over the next seven long years: close air support, interdiction/deep air support, helicopter escort (in which it would be the first fixed-wing squadron to

give landing zone preparation and support for tactical combat operations), radar-directed bombing, rescue, combat air patrol, and flak suppression, with some attack missions flown at night.

The day after arrival, all 15 aircraft were being uploaded with ordnance. All spare hands were engaged in setting up work areas on the side of the perimeter, erecting a tent camp about two and a half miles away, and constructing utilities. Everyone tried to get used to the oppressive heat and humidity.

General Fontana was highly pleased with the "splendid demonstration of operation and coordination" of the movement, and sent his congratulations on the "fine professional performance . . . [which] can serve as a goal for the remainder of this command."<sup>101</sup> McGraw and his squadron were placed under the operational control of the Commanding General, 9th Marine Expeditionary Brigade (9th MEB), Brigadier General Frederick J. Karch.

Sixty-nine hours after departing Japan, the first combat missions were flown. McGraw led a huge flight of 12 Phantoms which fired a large number of 2.75-inch rockets under the direction of a forward air controller (FAC) in a spotter plane. The targets were Viet Cong positions in the contested mountainous jungle terrain of "Happy Valley," 17 miles southwest of Da Nang (and site of some of the earliest Marine ground combat). The results were "unobserved."<sup>102</sup> That same evening, Captain James R. Sherman, leading a flight of four, was diverted to a rocket attack on a coastal hamlet 20 miles northwest of Hue, where a new Marine BLT had been making landings.

The squadron now settled into an around-the-clock operation, but it was not easy. The Ghosts found transportation between their tent and work areas to be a continual problem, and meals and showers at first required an eight-mile round trip. Ordnance loading was done by time-consuming Marine muscle power alone, and the Ghost loading crews looked with envy at the low slung, self-

propelled loaders of the neighboring USAF squadron. Two of these were borrowed, and an order was placed to get some for the squadron. The loaders could do the job in a fraction of the time with much greater safety, but they frequently broke down in hard service, so much of the ordnance uploading in years to come would still be done the traditional way by "Marine power."

On 15 April, two large bombing strikes of eight aircraft each were led by McGraw and now-Major Keith Smith on a long, 600 nautical mile, round trip flight to the Vietnam-Cambodia border zone. The area was one of the many end-points of the Ho Chi Minh Trail system that traversed Laos and Cambodia under a heavy jungle canopy. The squadron's mission would be one of many frustrating efforts to strangle the Viet Cong (VC) supply lines. McGraw commented afterwards on the difficulties of large attack formations: confusion in coordinating attacks, the liability of breakdown of radio discipline, plus wasted fuel and pilot energy in station keeping. As a result, most missions would now be flown as sections of two aircraft or divisions of four.

The next morning, McGraw led a division back to the same area, and that afternoon, the executive officer, Major John J. Metzko and his RIO, Warrant Officer Charles A. L. Lawrence, led four F-4s some 690 miles on the furthest strike yet. The target was a VC weapons depot and liaison post 18 miles south of Saigon on the edge of the Mekong River delta.

Several logistics problems of a serious nature now manifested themselves. First was the prodigious appetite of the Phantom for JP-4 jet fuel, 52,675 gallons of it alone on the 15th.\* Far more troubling was a "critical shortage of all iron bombs." On these missions, each aircraft had carried either six 250-pound bombs, or a fewer number of 500-pounders or 1,000-pounders.<sup>103</sup> America's Vietnam buildup had caused shortages

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\*In contrast to other Services, Marine Corps fixed-wing aircrews rarely self-reported their battle damage assessments (BDAs) during the Vietnam war, unless strike results were relayed by FACs or ground observers. Most Marine flyers felt that accurate BDA from a fast-moving aircraft was difficult, if not impossible, to determine. Neither was there pressure from above to self-report BDA, for fear that such claims might rise to fulfill expectations, and thus possibly give a distorted picture compared to actual results.

\*JP-4 was a naphtha-based jet fuel. Normally, USMC aircraft used the much less flammable kerosene-based JP-5, which the Navy specified for use on board ship. While at Da Nang, VMFA-531 would use only JP-4 in common with USAF units. The squadron typically used 25,000 - 55,000 gallons per day.

<sup>102</sup>This was possibly the first use in combat of the long-lived, versatile MK 80 series of low drag bombs. The MK 81 was a 250-pound bomb, the MK 82 500-pound, MK 83 1,000, and the MK 84 was 2,000 pounds. The MK 81 and 82 could be fitted with selectable high drag fins ("Snake-eyes") for lay-down delivery. Either electrical or mechanical fuses could be used. Laser guidance became an option in the 1970s.



VMFA-531 Far East Cruise, 1964-1965

*LtCol William C. McGraw, Jr., the squadron's commanding officer, briefs -531 pilots prior to a close air support mission in Vietnam.*

of all types of conventional ordnance, and manufacturing companies struggled to catch up. So McGraw requested that the Bureau of Weapons approve the use of the USAF's 750-pound MK 117 general purpose bomb on the F-4B. Eventually it was approved.

On the 17th four 4-plane strikes were flown. Two were to the rugged highlands about 10 miles west of Kontum, another to Happy Valley, and the last against the southern end of the A Shau Valley, a logistics funnel for the Communists.

The following day, however, VMFA-531 was able to go to work in the specialty of offensive Marine aviation: close air support. Eight Phantoms came on target south of Da Nang in support of a joint USMC/ARVN (Army of the Republic of Vietnam) operation involving elements of a Marine battalion and two South Vietnamese battalions. Each aircraft carried six 250-pound bombs, delivered in 30 degree dives under the direction of an airborne forward air controller or FAC(A). The "target area was saturated with bombs." Major John J. Metzko and Captain Daniel Prudhomme had led the Corps'

first combat close air support (CAS) mission in 12 years. Later, on the 18th, eight more Ghost F-4Bs attacked fortified positions 32 miles south of Da Nang with 2.75-inch and 5-inch Zuni rockets which sent enemy troops fleeing.

The Ghosts were part of a supporting arms system that had been carefully worked out between aviation and ground Marines in the years beginning in the 1920s in Nicaragua and Haiti and perfected in the Pacific. It involved requests for close air support by FACs relayed to a direct air support center (DASC), and from there to a tactical air direction center (TADC), which would then scramble the flight. Once airborne, the pilots checked in with all three, and usually a small spotter plane or helicopter pinpointed the target. Then the pilots made their bombing run.\*

On the 19th, 10 specialists were flown in from Iwakuni. They brought with them arresting gear for the runways. This equipment was vital to

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\*For a detailed account of how this Marine specialty was carried out, see Appendix C.



Department of Defense Photo (USMC) A185087

*F-4B Phantom jet of VMFA-531 parked on the Da Nang airfield in April 1965.*

stopping a Phantom safely should its complex utility hydraulic system be damaged in combat, or for stopping on a wet runway.

The most significant mission that day was the first helicopter escort mission of the war, led by Major Keith Smith and Chief Warrant Officer-2 Kenneth E. Strayhorn with First Lieutenant James A. Gress and Chief Warrant Officer-1 John D. Cummings. They picked up their helicopters and escorted the small green Sikorsky UH-34Ds in the racetrack pattern developed back in Cherry Point in 1952, flying at 300 or 350 knots to the helos' 90 to 100. At the western reaches of Happy Valley, they saturated the landing zone with 2.75-inch rockets. Heli escorts and landing zone preparations—LZ Preps—would become a hallmark of Marine fixed wing aviation in Vietnam.

On the 20th, 24 sorties were flown to the Que Son Valley from dawn to mid-afternoon. At least a dozen of them were fired upon by "light, .50-cal automatic weapons" as they made their rocket

and bombing runs. This was one of the first times VC forces had ever been under a close air support attack by jets, and they would soon learn not to shoot at the small spotter planes for fear of what might come next. Their small arms fire failed to connect, probably due to their failure to allow enough lead for Phantoms making 500 knots while pulling out at four Gs. The ordnance loads were relatively light due to shortages—typically a pair of 19 shot 2.75-inch rocket pods, plus a four-shot Zuni pod, or a pair of 250-pound bombs.

The next day, McGraw led an afternoon six-plane rocket strike on a wooded trail network within a thousand meters of the Laotian border, at a point just five miles north of Cambodia. The VC and NVA (North Vietnamese Army) were no respectors of international boundaries, and, by year's end, Marine jets would be striking into Laos itself in missions to interdict the Ho Chi Minh Trail.

The *Snohomish County* finally arrived after an 11-day voyage and disembarked 70 men and 650,000 pounds of cargo. VMFA-531's in-country strength now stood at 46 officers and 364 enlisted men, plus a Navy doctor, two medical corpsmen, and two McDonnell technical representatives.

By the 22d, the ordnance shortage reached crisis stage, and General Karch was forced to order temporary suspension of most of the unit's flight operations. However, two days later, the 9th MEB commissioned a CAS alert "hot pad," as ordnance to arm it now began trickling in.

On 25 April, the MEB launched Captain Don K. Hanna and Chief Warrant Officer-1 John L. Wenrich, Jr., and Captain Ronald J. Dusse and Chief Warrant Officer-2 James H. Stowell on the first CAS scramble, to attack VC snipers along a ridgeline west of Da Nang. A second scramble, led by Hanke and Schwarz, was told by the ground FAC that their rocket firing was so good that the VC refused to fire on the Marine patrol while the planes were overhead. The third section expended nothing in their hour and 20 minutes on station, since their mere presence "effectively suppressed all VC ground fire." From now on, as long as Marine jets were in Vietnam, ground Marines could depend upon a CAS "hot pad" on ready alert for help.

Another landmark mission was flown on 27 April, when Gilliard and Johnson, along with First Lieutenant John R. Gowell and Chief Warrant Officer-2 John T. Favaron, flew the first radar-directed bombing flights of the war. They were controlled by Marine Air Support Squadron 2, using the computerized precision guidance of a new radar, the TPQ-10, which had recently come into the inventory. As had been seen in the two previous wars, precision night attack was an extremely difficult proposition at best, and the TPQ-10 was developed by the Marine Corps to help close the gap.

From the aircrews' perspective, it was a simple operation which involved flying exact headings, altitude, and airspeeds. After the controller locked the Phantom into the radar's narrow tracking beam, he relayed computer-derived headings, instructed them to arm their weapons, followed by the command: "Standby, standby . . . Mark!" whereupon the pilot pressed his bomb button. Provided the winds aloft were known, the system's accuracy was quite good: within a few hundred feet.

By the 29th, two 2-plane "hot pads" were in

effect, one for the 9th MEB and one for I Corps in general, with ordnance loads creeping up slightly to 4-6 bombs per aircraft plus rockets. The next day Captain Michael P. Sullivan and his RIO from Key West days, CWO Charles C. Taylor, along with Captain John K. Cochran and Warrant Officer-1 Roy E. Simolin, flew the first air-to-air sorties. These were practice GCI/AI radar intercepts, under the control of a USAF radar site. The first Marine GCI unit, Marine Air Control Squadron 7 (MACS-7) would arrive shortly with better gear.

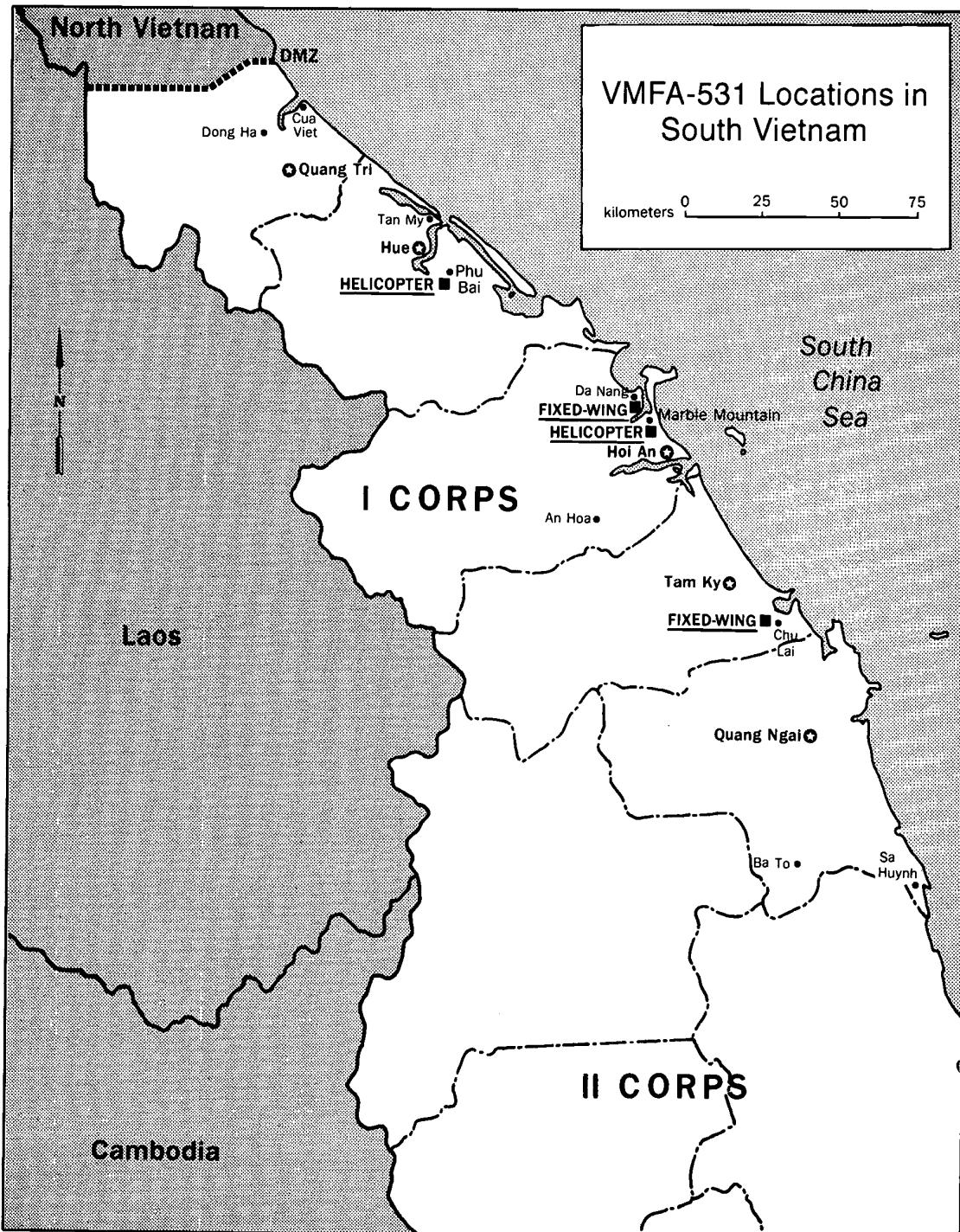
At the end of April, McGraw looked at the accomplishments of VMFA-531 to date: 233 combat sorties flown in 280 hours. Forty-two of the sorties were flown in support of Marines, the rest were for the 2d Air Division, the major USAF command in Vietnam at that time. In the ICTZ alone, the Ghosts were credited with 225 structures destroyed, two caves blocked, two "secondary explosions," and one bridge destroyed. The efficacy of helo escorts had also been clearly shown: "It is readily apparent that the VC will not fire on helos or ground patrols when fixed wing air is overhead." The repeated praise of FACs concerning the Ghosts' accuracy on target was "due to the teamwork of the RIO/Pilot."<sup>102</sup>

On 3 May, south of Quang Ngai a Communist concentration was discovered and pounced on by three Ghost divisions. The weather was "very poor," which necessitated shallow bombing runs, with the result that one F-4B acquired a dented drop tank and a foot long gash in a flap from bomb fragments. When the damage to the enemy was totaled up by the district chief, he credited the Ghosts with 22 structures destroyed, 11 VC killed by air, 27 VC wounded by air, and 1500 kilograms of Viet Cong rice destroyed, along with four of their rice storage houses.\* Ninety-two refugees returned to government control, bringing 100 head of cattle with them. Only forty 250-pound bombs had been expended.

After nine helo escort sorties near Da Nang on 5 May, two divisions struck a VC stronghold about 15 miles west of Chu Lai, where Marine landings were scheduled two days later. Captain Daniel Prudhomme with Major William E. Henson led the first division, followed by the executive officer, Major Metzko, and Warrant Officer-1 Harold

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\*Killed by air (KBA) and wounded by air (WBA) were the standard terms in Vietnam to describe casualties caused by air strikes.



W. Frazier, with the second division.\* Each aircraft carried only two or three bombs.

\*Major "Willie" Henson was the senior RIO along with Major Austin O. Gandy. This was his third war and third -531 tour. The F-4B was his third Ghost aircraft after the F7F-3N and F3D-2.

A post-attack intelligence report stated that the Ghosts had bombed a VC armory and training base with startling accuracy: 41 VC troops and 62 "VC draftees" were KBA with their weapons. Also destroyed were two .30-caliber machine guns and three automatic rifles. Other destruction included a rice mill with its machinery, 36,000 kilos of rice,

and two workshops. The report went on to state that the damage was so severe the VC were looking for an informer, since no outsider could have known the location of this tightly controlled area.<sup>103</sup> If the report was true (and such informer reports had to be taken with a grain of salt), it is possible that these missions helped keep the Marine landings at Chu Lai two days later free from enemy interference.

The 6th was equally interesting, because the squadron made its first strikes into North Vietnam. A USAF jet had been shot down about five miles north of the DMZ. Two Ghost sections were scrambled, and direct hits were reported on the enemy antiaircraft guns. The debrief noted, "Moderate to heavy Flak of 37 and 57 mm, radar-controlled, [was] encountered . . . at . . . 10,000 [down] to 3,000 feet." The area—soon to be code-named "Tally Ho"—became notorious as a flak trap which brought down a number of Marine flyers over the years.\*

The 7th was D-Day at Chu Lai, and the Ghosts flew four sorties to attack the Viet Cong 10 miles west of the landings. They carried the heaviest loads yet: six bombs and four rocket packs per plane. Chu Lai would soon become the largest Marine air base in Asia. That same day, III Marine Amphibious Force was established at Da Nang. The squadron also welcomed a Sparrow missile team to keep the Ghosts ready for any eventuality on the air-to-air side of any mission.

Ten sorties were flown around Chu Lai on the 10th, and the first night missions of the war were flown beginning at 2200, when bombs were dropped on a concrete bunker complex southwest of Da Nang using TPQ-10 radar. Night harassment and interdiction using TPQ-10 would become a regular feature of Marine air in Vietnam over the next seven years.

The 13th was notable on two counts. The first was the squadron's initial use in combat of napalm, three 1,000 pound tanks expended along with bombs and rockets on the Laotian border. Secondly, the first night CAS of the war was carried out west of Chu Lai, when troops of BLT 4, as well as a transport helicopter, were fired on by automatic weapons and small arms. Two Ghost F4Bs were scrambled to their defense a half hour

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\*The commanding officer of another VMFA squadron later commented: "it was only a 'flak trap' if you made too many wrong runs." Losses occurred, he felt, "by making multiple passes . . . in the daytime."

after dark in restricted visibility. To complicate matters further, no flares were available, but somehow they were able to locate their targets in the dark. The BLT's commanding officer subsequently sent a message stating that "the fast reaction and can-do spirit demonstrated by [the flight] made this mission a complete success. The target was destroyed. My appreciation for a job well done."<sup>104</sup>

More dramatic CAS action came the next day when a Marine patrol got pinned down by intense fire from a wooded ridgeline northwest of Da Nang. Two "med-evac" helos were chased off and called for help. Eight -531 Phantoms were promptly scrambled. The first attacks silenced two dug-in automatic weapons positions with direct hits and gave the patrol freedom of movement. Now the Ghosts began working close in to the patrol itself—sometimes to within 60 - 80 feet of its position—sweeping west to east, killing several Viet Cong and "driving the others out of their entrenchments into [the patrol's] line of fire," in the words of the company's grateful commanding officer.

He and his patrol leader visited the squadron the next day to thank the Ghosts personally, and wrote that the "prompt and accurate close air support flown by the Phantoms of VMFA-531" was the "factor enabling my patrols to withdraw successfully with a minimum of casualties . . . [and] clearly demonstrated the outstanding effectiveness of the Marine air ground team."<sup>105</sup> The Ghosts flew a record 25 sorties that day.

On the 15th, the squadron was placed under the operational control of the 1st MAW which, in view of the continuing ordnance shortage, immediately authorized aircraft to land with unexpended ordnance. Actually, the squadron had been doing this all along, unofficially. Moreover, critically scarce rockets were only to be expended in support of Marines. For their own local defense, the Ghosts had established a ground defense company two weeks earlier. Even if he spent his day turning a wrench, a Marine was still a Marine, and all Ghosts knew the business end of the M-14 rifle.

A pace of about 18 sorties a day continued through the end of May, but the wear and tear of combat began to tell on the equipment. Even so, the hard-working maintenance troops usually kept 13 of 15 F-4s airworthy, a remarkable average.

Battalion Landing Team 4 again sent thanks for

some timely night close air support on the evening of 17 May, when Captain Michael P. Sullivan led a division against entrenched Viet Cong a few miles west of Chu Lai. Without flares and in poor visibility, they suppressed all fire, destroyed three structures, got two secondary explosions, and left with 13 fires raging on the ground. For their trouble they were fired upon during landing approach back to Da Nang.<sup>106</sup>

Three days later, McGraw and Major Austin O. Gandy led another division 19 miles west of Chu Lai under the control of I Corps' senior air liaison officer, a USAF lieutenant colonel. He radioed back that it was the best bombing he had seen in Vietnam.

One squadron mission on 26 May managed to expend no ordnance at all as they made multiple non-firing passes over a trapped Marine patrol 10 miles southwest of Da Nang. The noise and smoke from the F-4Bs "effectively prevented the VC units from bringing . . . fire to bear on the patrol and evacuation helos by keeping their heads down!" The Commanding General, 3d Marine Division, Major General Lewis W. Walt, sent a "well done" praising the "high degree of professionalism . . . [in] a commendable example of the ability of dissimilar commands to operate in close harmony."<sup>107</sup>

The next day, two Ghost flights were singled out for praise by the commander of HMM-163. Lieutenant Colonel Norman G. Ewers was leading his helo squadron's and HMM-161's landing of two infantry battalions involving some 900 troops. Ewers wrote: "Timing and precision of attack by fighter aircraft were of critical importance to the assault landing. The fire support delivered by the pilots of VMFA-531 was superb." He went on to describe a multi-squadron assault near An Hoa, the largest yet attempted in ICTZ. The simultaneous LZ Preps commenced exactly as the helos departed their initial point, and continued up to the last possible moment before touchdown, completely neutralizing the area.<sup>108</sup>

In years to come, most -531 aircrews would recall the action from 30 May to 4 June near the Ba Gia outpost (10 miles west of Quang Ngai) as their most memorable action. The Ghosts called it the "Battle for Quang Ngai" in their debriefs. Taking advantage of monsoon-like weather, the 1st VC Regiment ambushed the 1st Battalion, 51st ARVN Regiment, which had been dispersed in a pacification program. For six days and nights, VMFA-531 ran mission after mission of CAS,

unloading 250 and 500-pound bombs, Zuni missiles, and 2.75-inch rockets in a rain of fire on the Viet Cong. In spite of this concentrated effort, only 65 of 500 South Vietnamese soldiers, with three American advisors, were able to make it through the lines to safety, while leaving virtually all their weapons behind.

Finally, by 3 June, the constant air pounding helped to drive the 1st Viet Cong Regiment on the run westward. That night a sizable body of Viet Cong were located in a river bed. Two Ghost sections attacked with Zunis and 500-pound bombs under the light of flares. The Special Forces' FAC(A) reported back that the Ghost night strike had "resulted in 168 Viet Cong KBA/WBA, 30 civilian ammo bearers KBA/WBA, and 100 [more] deserted." This was the most deadly attack ever made by VMFA-531.

The Ghost's reputation in night close air support was now very high; up to this time they had evidently been the sole practitioners of this difficult and dangerous art in Vietnam. However, the end of -531's combat tour now loomed. Part of the squadron departed 4-6 June for Atsugi. Nonetheless, a full schedule was kept up, including the longest missions of the tour. These were six sorties scrambled to the Mekong Delta area 30 miles southeast of Saigon. The 700-mile round trip of one hour and 50 minutes, while carrying 3,000 pounds of ordnance per aircraft, was a clear example of the combat radius of the F-4B without aerial refueling.

Beginning on 11 June, the remaining VMFA-531 aircraft were ferried out to Atsugi. The last day of combat operations was 14 June, with missions which included helo escorts, an attack on pillboxes and bunkers, and a strike against three Viet Cong battalions. Transferred to MAG-11 at Atsugi, the squadron was relieved by VMFA-115, and at 2400 on 30 June 1965 one of the most memorable periods of -531 history came to a close.

The Ghost record in Vietnam was impressive and equaled that of some squadrons yet to come which had much longer tours. It flew 970 combat sorties in 1,232 hours in 333 missions. Two hundred and seventy-five sorties were in support of their fellow Marines, mostly close air support and helo escort, as well some TPQ-10 radar-directed bombing missions. The rest were in general support of the USAF 2d Air Division. Some types of missions were flown for the first time in Vietnam such as helicopter escort, on-call

close air support from “hot pads,” night close air support, TPQ-10 radar-directed bombing, and the first Marine strikes into North Vietnam and Laos. The squadron was credited with 300 Viet Cong killed, 127 more wounded, 913 structures destroyed, with 168 more damaged, and 32 secondary explosions. The aircraft availability rate of 92.5 percent was likely the best achieved by any Marine F-4 squadron in Vietnam, and was the product of a smoothly functioning and skilled maintenance team, most of whom had been together for more than three years.

Many other Marine jet squadrons would come to Southeast Asia in the next seven years, but the Grey Ghosts of VMFA-531 were the first. Theirs was an enviable and essentially flawless combat record, which would be recognized when they were included in the award of a Presidential Unit Citation to the 1st MAW, and also awarded the Navy Unit Commendation for their service in Vietnam.\*

#### *Cherry Point Again: Rebuilding and Training*

As in the two previous tours, the Ghost squadron’s colors and “Charlie,” the diminutive skeleton mascot in his ethereal robe with pointing finger, returned to Cherry Point and MAG-24. A cadre in training status was activated as the latest reincarnation of VMFA-531, and, on 2 July 1965, Lieutenant Colonel Robert L. Wildey became its commanding officer.<sup>109</sup>

Within two years, more than 113,000 Marines would be in Vietnam in III MAF’s two divisions and huge aircraft wing. Half of the operational Marine squadrons—including five F-4 units—would be in WestPac, which would place an enormous strain on those remaining in the United States to provide trained replacements. It would be in this training role that VMFA-531 would serve for most of the Vietnam years. But it would end those years in two, new, leading and exciting roles: a revitalized air combat mission and its first extended deployment on board a carrier.

The new Ghosts worked up in readiness through a two-month deployment to Roosevelt Roads, beginning in late November 1965. One mission at “Rosey Roads” would be extensive air-ground ordnance practice.

During this time, the squadron was joined by a

diverse and interesting group of officers who gave VMFA-531 a wide breadth of experience. First to join, as the Ghosts began reforming, were two RAF flight lieutenants; they were followed by two USAF pilots early in 1966; then a number of Key West/Vietnam Ghosts also rejoined to provide leavening, including the maintenance expert, Captain O’Neal (soon to be a major). In addition, a new, young type of RIO began joining. He was a commissioned officer—usually a lieutenant—who had won his naval aviation observer wings after coming through the Officer Candidate and Basic School training pipeline.\* The old-timer warrant RIOs would shortly be offered temporary commissions for the duration of the Vietnam war, and most of them would rise to captain before reverting to their former rank. Finally, there was the arrival, on 5 May, of a new commanding officer, Major Frank D. Topley.

The bulk of VMFA-531 training flights, after initial familiarization, was devoted to radar-intercept practice, some 52 sorties in all. Half a dozen flights were conventional air-ground ordnance, and only three involved air-combat maneuvering. In the fall of 1966, the realities of Marine Phantom missions in Vietnam would be accepted at Headquarters Marine Corps, and the air-ground syllabus was increased to 20 flights.<sup>110</sup>

The major event of 1966 was another four-week deployment to Roosevelt Roads, led by Topley. The non-stop 1,487-mile flight to Puerto Rico, with aerial refueling, departed on 27 July in terrible weather. There was nothing visible but continuous thick cloud from liftoff until sighting the KC-130F tanker after nearly two hours and a radar rendezvous.

The squadron’s main effort concentrated first on a missile “shoot” using the excellent facilities of the Atlantic Fleet Missile Test Range. Aging Sparrow missiles, whose warheads were replaced by telemetering gear, were fired against drones launched by planes from the local Navy squadron. Sidewinders were also fired against flares. The deployment was rounded out with air-ground ordnance training on the range on nearby Culebra Island.

The climate was like Vietnam. Some who knew said it was worse, especially when choking

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\*See Appendix F for citations.

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\*Within two years’ time, the NAO field would become unrestricted, with NAOs being redesignated as naval flight officers. Indeed, several former Ghost RIOs would go on to command VMFA squadrons.

clouds of mosquitoes took wing at dawn and dusk. There was still time for high spirits: the clubs offered free rum on Tuesday nights, and then there was an attempted abduction of -531's mascot, "Charlie." The neighboring Navy squadron was suspected, and it was soon determined that 22 rolls of toilet paper could be stuffed into the recesses of a Navy F-4's speedbrake panels. Extending speedbrakes on downwind at the right instant next resulted in an antenna collection on top of a certain hanger being festooned with a satisfying amount of paper! Two squadron commanders were subsequently asked by an admiral to declare peace.

Returning home, the Ghosts found they had been awarded the Fleet Marine Force annual Aviation Safety Award for Fiscal Year 1966 for having flown 3,836 accident-free hours. On 15 September, the unit's NORAD backup capability was tested in an all-night air-to-air weapons exercise. November saw a 17-day air-ground weapons deployment to MCAS Yuma, Arizona, site of the best ordnance ranges in the naval service. This was the first of many Yuma deployments the Ghosts would make.

On 10 December, aircrews began SATS (Short Airfield for Tactical Support) qualifications on the island strip at the nearby auxiliary Bogue Field. Carrier deck space was now at a premium, due to the demands of Vietnam, and SATS was the closest equivalent. Qualification also included launches by a J-79 powered catapult, the same engine as the Phantom's. Compared to a carrier's violent catapult stroke, the SATS system gave a powerfully smooth acceleration over its more than 1,000 feet of run.

Major Roy A. Seaver took command on 16 December, and at year's end noted that 13 pilots and six RIOs had been sent to WestPac. Aircraft and people had been stripped from stateside units, and -531 operated with an average of only 13 F-4Bs on hand. Personnel averaged 50 officers and 210 enlisted men, the latter about two-thirds of normal.

The training pace in 1967 was stepped up considerably to cope with the demands of the five WestPac F-4 squadrons. There were Sparrow and Sidewinder shoots in late February, followed immediately by a 27-day Yuma deployment. At Yuma, the Ghosts broke two Marine F-4 flight time records: 1,016 hours in March and an amazing 1,290 hours for the deployment itself. Despite the pace, the milestone of 10,000 accident-free

hours was passed on 15 February. There were two more Yuma deployments in May and October, with -531 spending 69 days there in 1967 alone. Twenty-two pilots and 16 RIOs were sent to WestPac that year, including Major Seaver, who was succeeded by Lieutenant Colonel William K. Parcell on 15 July.

On 7 November, VMFA-531 took delivery of the newest Phantom model, the F-4J with its revolutionary pulse-doppler radar known as AWG-10. Other (Navy) priorities would preclude further introduction of the J-bird to VMFA-531, although the F-4J—later rebuilt as the F-4S—would arguably be the best air-to-air Phantom ever built.

For some time now, the limitations of individual squadron training had been apparent. A newly designated aviator or NFO would report directly to his Fleet Marine Force (FMF) squadron with no intervening training. What training he actually received before being sent overseas varied from good to indifferent, according to the abilities and priorities of each squadron. Inevitably there were gaps, dilution of effort, and lack of standardization.

To overcome this, the Marine Corps embarked on an ambitious program of establishing operational training squadrons. The Phantom program received early attention because its syllabus was the most lengthy and complex of any USMC aircraft. It involved most of the possible fixed wing missions: interception, air combat maneuvering, and visual ground attack, in addition to ancillary missions like aerial refueling, electronic warfare, and carrier/SATS qualification. On 1 April 1968, the first Marine Fighter/Attack Training Squadron, VMFAT-201, was established at Cherry Point, using the assets of VMFA-531. The Ghost's flag was sent to the 3d MAW's MAG-33 at MCAS El Toro, California, thus ending nearly a quarter of a century of -531 association with Cherry Point.

#### *Rebirth and Renaissance at El Toro*

On 1 April 1968, simultaneously with its stand-down at Cherry Point, VMFA-531 was recommissioned in a training status at El Toro, with Major Karl A. Zimmerman as its commander—and sole member. As Southeast Asia continued to require assets and manpower, rebuilding the squadron would be a long and frustrating affair. By the end of May, only 95 Marines were on board—a combination of some recently returned veterans from Vietnam, and others newly minted from truncated

boot camps and technical training schools.

The immediate mission was to shuffle worn-out F-4Bs through a modernization program at NAS North Island near San Diego. On 27 May, for instance, 20 Phantoms suddenly appeared on the flight line. They were the sorriest bunch of aircraft the older hands had ever seen: covered with battle damage patches, splotches of corrosion-control paint, and carrying the markings of virtually every Marine and Navy F-4B outfit in WestPac. However, the number of aircraft was not matched by any similar amount of maintenance or test gear, and the Ghosts were only able to eke out about two sorties per day.

Zimmerman stepped down to executive officer on 26 July, and the new commanding officer, Lieutenant Colonel Richard "Pappy" Perez, found the squadron faced with two primary tasks: the preparation and transfer of modified and overhauled F-4s to WestPac, and the training of new pilots and RIOs. The first nearly precluded the second. As each refurbished Phantom was brought to fully "up" status, it was summarily dispatched to WestPac—nine F-4Bs alone in 1968—thus hobbling the training effort.

Unable to provide all the desired flight hours to the new aircrews, Perez decreed a comprehensive training program to be established. No aircrew member in training was to have any collateral duties whatsoever; all efforts would go into mastering the F-4 and its missions. Flights would be tailored so that double or triple the normal training would result, and ground training was run continuously in the Ready Room.

And then there was the case of Chief Warrant Officer John W. Bardon, master healer of radar. He was the Ghost avionics officer. A veteran of Korea and later Vietnam, he had somehow managed to acquire several hundred hours and 68 combat missions in F-4s, despite the fact he wore no wings, and indeed had no formal NAO/NFO training at all. He did, however, possess an encyclopedic knowledge of radar and a love of flying. The former he communicated effectively to his troops, with the result that VMFA-531's radar availability quickly rose to well over 90 percent—quite likely the highest in the naval service at the time. Flying in the Phantom without proper NFO designation was quite another matter, as this was strictly prohibited by regulation. An appeal was made with much behind-the-scenes arm twisting, and Bardon was sent quietly away. In a month's time he reappeared, proudly wear-

ing NFO wings, after completing an abbreviated training program at NAS Glynco, Georgia, in only a tenth the normal time. He would be the last up-from-the-ranks warrant officer to be designated an NFO in the Corps.

By the end of 1968, the squadron was stabilized and performing both its assigned missions. In addition, the Ghosts would make four ordnance deployments to Yuma in 1968-69, plus another to NAS Point Mugu for a missile shoot at the Pacific Missile Range. Two more Sparrow shoots were conducted from El Toro in the last half of 1969. However, events and decisions had been unfolding in 1968 and were to have a great influence on the future of the Marine fighter community, and once again, VMFA-531 would be in a pioneering role.

A study which analyzed every engagement to date between MiG fighters of the North Vietnamese Air Force and U.S. aircraft was disturbing.<sup>111</sup> Engagements over North Vietnam were approaching a one-to-one exchange rate in shootdowns. This analysis augured poorly, not only for the current situation over North Vietnam, but also for potential future conflicts. The solution would have to be superior training.

In all the American Services, the advent of nuclear weapons and missiles led to a steadily decreasing capability in air combat maneuvering (ACM). It was not thought to be necessary in modern warfare with the new ability to fire radar missiles without the crew actually sighting the enemy aircraft. But the missiles themselves were designed for non-maneuvering targets, and the F-4B had no internal guns for close-in work. The Phantom had been designed for high speed rather than agility, and many pilots were afraid to push it to its limits, since it had a well-publicized "flat spin mode" from which recovery was impossible. Finally, the F-4B's engines left a smoky trail which advertised its presence up to 20 miles away. All of these disadvantages had to be overcome.

Perez and his successor, on 25 July 1969, Lieutenant Colonel John L. Thatcher, were both committed to an effective ACM program. They were aware that it was an inherently dangerous activity which was carried out on intense short flights but, to their credit, the alternative of sending crews into combat without such training was never considered. Thatcher—a Ghost veteran of the Hise Skyray era and former executive officer of a Vietnam VMFA squadron—had earlier gotten the Corps' first dissimilar ACM program in jets

going in May 1968 at MAG-33. He had designated the first ACM instructors who fought against the F-4Js.

Outside the squadron, beginning in 1968, new policies and programs were established to revive the art of fighting in the air. The official syllabus was rewritten to incorporate maximum performance maneuvering practice from the beginning of training, followed by formal ACM training and radar intercepts using new visual identification tactics, and also engagements with dissimilar aircraft.<sup>112</sup> The F-4B's subsonic G-limits were raised to 8.5 Gs in fighting configuration at low altitudes where the Phantom excelled in performance. Research was started to improve the heavy, double-visored helmet, which was unsatisfactory for high G maneuvers. Efforts were also begun to improve missile maneuvering performance. Newer versions of the Sidewinder in the 1970s could track higher G targets. The first Sparrow missiles were hard to use in ACM, but now the new "Dogfight" Sparrow arrived (although the Ghosts rarely got to carry them at first). The quality of instruction was given a big boost by the formation of the Navy Fighter Weapons School at Miramar in 1969. The first Marines to attend "Top Gun" school flew a Ghost F-4B there: Majors David G. Vest and Noel E. Douglas.<sup>113</sup> Besides high intensity ACM against various aircraft, they fired missiles against maneuvering drones.

Possibly the most effective training device ever developed for fighter crews was the Air Combat Maneuvering Range and its follow-on version known as the Tactical Aircrew Training System, on which Ghost crews trained after 1972. "Controllers" vectored the fighters onto their unknown but real opposition in an electronic arena east of Yuma, Arizona. Under strict rules of engagement, aircrews used tactics to work into firing position without being "shot down" themselves. The training system randomly programmed simulated mis-

sile failures, in addition to those errors provided all too easily by the crews themselves. If tactics, aggressiveness, awareness, and numbers were not right, an opposing fighter might succeed in a "kill," whereupon the computer surrounded the victim's aircraft symbol with a tiny coffin.<sup>114</sup>

At the squadron level, maximum performance maneuvers began at an early stage, with an emphasis on control, to prevent the Phantom's famous post-stall spin. With self-confidence gained early on, crews were now trained in Phantom versus Phantom engagements to learn the fundamentals, then moved up to two versus two, and finally went against dissimilar adversary aircraft like the more nimble A-4 and later the Northrop F-5E. To overcome the Phantom's poor turn rate, pilots were trained to fight low and fast—at least 420-450 knots—and to use slashing attacks.

The RIO's role underwent even more radical change. Now, in addition to conducting the interception itself, he had to be able visually to track and assess various threats to his own and other friendly aircraft, advise his pilot calmly and concisely, and even talk his pilot through maneuvers. In short, he had to become as knowledgeable as his pilot in all the aspects of fighting in the air.

New formations were introduced: the "combat spread" where two aircraft flew about a mile abeam each other at different altitudes, to provide maximum lookout and protection from stern missile attacks. The wingman was given the latitude to initiate engagements.

After March 1969, the Ghosts began practicing the new Navy visual identification tactic. In addition, the F-4's radar was used as an extension of the pilots' eyes to help position the flight for both identification and advantageous attack. This combination permitted the flight to engage from the most favorable position, maintain the offensive, and give an outnumbered flight the best chance of success. The notion that a "mere" wingman could be a deciding factor was revolutionary, but made sense in light of the fact that most air combat engagements lasted only a minute or two at the most. But this new philosophy of ACM and visual identifications required hard training at all levels just to remain minimally proficient.<sup>115</sup> This brought the squadron's pilots and RIOs even closer together: the product of a situation wherein total mutual trust in each other's ability and split-second decision-making was necessary just to stay alive, let alone prevail, in simulated or real combat.

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\*This precedent came about in a curious way, illustrative of the value of personal relationships. Early on, Thatcher became good friends with the commanding officer of the school, and later noted that "at that time the Navy squadrons had not yet learned the value of this superb air combat maneuvering course. Each class had some cancellations just prior to starting, too late to get additional students. With the concurrence of the wing commander, I agreed with the commander of the 'Top Gun' School that I would have an aircraft, aircrew, and ground handling personnel on board within twenty-four hours to fill a vacancy any time he had a cancellation of a quota."

In spite of all these developments, progress was very slow for VMFA-531 in 1969. Again, a personal relationship opened the door to progress. Thatcher became friends with the Marine commanding officer of the unit which ran weapons systems inspections throughout the Navy and Marine Corps, Lieutenant Colonel Robert Solliday at Point Mugu. When Solliday came to El Toro in late 1969, Thatcher later recalled:

VMFA-531 had just passed through four of the worst months in its history. We had been lucky to fly a hundred hours a month, because of sending combat ready aircraft to WestPac. . . . We discussed the problems -531 was having, and I described a lack of trained enlisted personnel and aircrews. Bob advised me that he had approximately 50 highly trained technicians working for him from all fields. He was in a slack period nearing the Christmas holidays and believed that he could help us train our personnel.

Thatcher leaped at the offer, cleared it with his wing commanding officer, and welcomed a team from Point Mugu which arrived to conduct an "unofficial" weapons system inspection during December 1969. Afterwards, Thatcher reflected on the results:

This was the turning point for our squadron. We underwent three weeks of intensive training that culminated in a successful missile shoot. During the remaining months that I commanded VMFA-531, we flew approximately 500 hours of productive combat training each month. The team from Point Mugu conducted an official Weapons Systems Inspection just prior to my departure from being the commander, and in the words of the team leader, VMFA-531 was the most combat ready squadron they had ever inspected, Navy or Marine Corps.<sup>116</sup>

During this time, conventional ordnance training continued apace. On a December 1969 deployment to Yuma, the live bomb and napalm drop rate was 99.1 percent accurate in hitting the target. The first score on the 20mm gun pod showed only 70 percent accuracy, however. As a stopgap measure for close-in ACM situations, the

gun pod—originally designed for ground strafing—was pressed into air-to-air service, and the Ghosts began gunnery practice with it against towed target sleeves after 1970.

As 1970 was ushered in, VMFA-531 was well in the forefront of the practice and development of the new air-to-air tactics. Its WestPac aircrew training mission was also given a boost on two counts: the onerous WestPac ferry burden had been lifted earlier in the past fall, and new aircrews began coming on board who had already received their initial F-4 training at MCAS Yuma with VMFAT-101.

Now the Ghosts could concentrate on advanced training under the tutelage of an increasing number of "Top Gun" graduates; four crews alone in 1970, plus another from the USAF Fighter Weapons School at Nellis AFB, Nevada. Stability for experienced personnel increased as the demand in WestPac began to decrease. The NORAD commitment was picked up again and tested in a successful coastal defense exercise in early June. This was followed by what was probably the most sophisticated Sparrow missile exercise so far attempted by a Marine line squadron. Offshore from Point Mugu, first tour crews engaged in simulated combat with small jet drones maneuvering at 2-4 Gs; then 18 aging Sidewinders were fired, and all but one guided correctly in a fine display of just how far the squadron had come.

In another exotic area, defensive electronic countermeasures (DECM), -531 was also in the lead. Beginning in early 1967, naval jets had been fitted with provisions for self-protection against the rising electronic threat over North Vietnam. Although few US-based USMC aircraft were equipped with the scarce DECM "black boxes," the Ghost crews did train in an F-4B cockpit simulator. Sometimes, fully DECM-equipped F-4Bs passed through to or from overhaul. When this occurred, aircrews in training were sent out in them to an electronic warfare range, where they practiced tactics against simulated threat emitters.

The F-4B's DECM gear included active electronic deception systems as well as flare and chaff dispensers as countermeasures against radar and missiles. Along with this was an airborne IFF interrogator, used in conjunction with the F-4B's radar.

Having led the Ghosts through one of their most important transitions, Thatcher was relieved by Lieutenant Colonel Robert N. Hutchinson on

24 February 1971. At the time of his departure, -531 had about seven pilot/RIO teams who had graduated from "Top Gun," more than the rest of the Marine Corps combined. The high standard of the unit's training at the time was reflected in a former first-tour Ghost pilot being appointed a division leader within two weeks of his arrival in WestPac.

Meanwhile, the squadron was preparing for a deployment in a new direction: the Mediterranean Sea.

*To the Mediterranean on the Forrestal*

After another challenging missile shoot against maneuvering drones and an air-ground deployment to Yuma in March 1971, the Ghosts now faced yet another type of flying, the demanding one of the extended carrier operations at sea. The readiness of the squadron was tested in FMFPAC's first tactical readiness evaluation, which began with an overnight notification on 13 July. The wide range of the VMFA mission was shown in the lists of tasks accomplished in the next three days. The first day included an eight-plane air-ground ordnance delivery, followed the next day

by all of the air-to-air roles such as intercepts, visual identification, and large ACM engagements flown against dissimilar adversary aircraft. The final day was an "excellent" missile shoot.

One key to the Ghosts' success was its operations officer, and future executive officer and commanding officer, Major David G. Vest. A Vietnam combat veteran in 1968-69 with another VMFA squadron, he returned to be the guiding spirit in the new air-to-air tactics at El Toro before coming to VMFA-531. In October, he was presented the coveted Alfred A. Cunningham Award as Marine Aviator of the Year. Simultaneously, the R. Guy Robinson Award for the outstanding Marine flight officer was presented to -531's Captain J. D. "Little John" Cummings.

Following yet another Yuma deployment, the squadron was ordered to carrier qualifications on board the *Kitty Hawk* (CV 63) on 19-22 November with a sister squadron. Thus, they became the first FMFPac fighter squadrons to undergo such training since 1965. Seventeen crews became carrier qualified, including the new squadron commander, Lieutenant Colonel John T. Zych, Jr., who had taken over on 13 October 1971. At the same time, the Commanding General, 3d MAW,

*A port bow view of the aircraft carrier USS Forrestal (CV 59) underway in the Mediterranean.*

Department of Defense Photo (USN) KN23750



Brigadier General Leslie E. Brown, was asked to select a VMFA unit for deployment to the Mediterranean on board a CVA, to take some of the burden off a greatly overextended Navy carrier aviation force. He nominated the Grey Ghosts, making them the first Marine F-4B squadron to deploy on board a carrier. Apart from one other squadron, it had been six years since any Marine fighter squadron had served a tour on board a carrier.

On 27 February 1972, the Commandant, General Robert E. Cushman, Jr., formally selected VMFA-531 to go on board the *Forrestal* (CVA 59). The Ghosts had just completed another one of their patented missile shoots off Point Mugu, as well as a week-long dissimilar ACM exercise with Air Force F-106s. Two days later, they deployed for two weeks of conventional ordnance training at Yuma. The aircrews were now at peak readiness, although the maintenance department would now be forced to endure some pressure-laden times.

The largest task facing the Ghosts was the modification of 14 F-4Bs for sea duty, despite a nearly 100 percent turnover of maintenance personnel. Moreover, there would not be enough time for many men to attend specialist schools. Maintenance now went onto a 24-hour, seven-days-a-week schedule. Fourteen F-4Bs were transferred out and 10 others brought in, all of which had to be equipped with defensive electronic countermeasures gear and a datalink guidance system. To meet the special demands of carrier service, special landing systems were slated for installation. All hands also attended a fire-fighting course to prepare them for one of a carrier's most feared events, fire at sea. Now the Ghosts began to stabilize for sea duty on the *Forrestal* with 40 officers (17 aircrews) and 256 men.

On 12 May 1972, USAF C-141A jet transports lifted 212 Ghosts and 98,585 pounds of gear non-stop to NAS Oceana, Virginia, the Atlantic Fleet's main fighter base. The aircrews came in 14 F-4Bs, 12 of which would actually go on board. At Oceana they worked on field carrier landing practice (FCLP), following up their hard training at El Toro in night FCLPs. Carrier Wing-17's landing signals officer subsequently pronounced many crews ready to qualify with no more than a "night refresher." By 29 June, all 17 crews were day qualified, and 13 were night qualified after two landings on board ship.

The first days at sea were a new experience for nearly all the Ghosts. They struggled to master the maze of the ship's passageways and ladders to find their work spaces and bunks, which were stashed in diverse cubbyhole compartments. There was also the realization that they were no longer a direct supporting arm of Marines ashore, but defenders of a carrier battle group, and that they were by far the least experienced unit in carrier operations on board.

On 25-28 June, the *Forrestal* and Carrier Wing-17 underwent and passed at sea an operational readiness evaluation in all its missions. During a 37-plane strike escort, all three simulated "kills" against aggressor A-4s were credited to the Ghosts. The evaluator commented on -531's strong and weak areas:

Strong areas: (1) Strong and dynamic training program. (2) Excellent system availability. (3) Outstanding morale and enthusiasm throughout the squadron, and a high degree of competitiveness among aircrews. Weak areas: (1) Carrier performance; two pilots not night carrier qualified, and most crews need more work around the ship. (2) More EW [Electronic Warfare] training required. (3) No qualified LSO [Landing Signals Officer].<sup>117</sup>

Considering that hardly any Marines at all had flown jets on ships in years, and that the Navy had first claim on EW gear, this was high praise indeed. The ship and its wing were pronounced fully ready for their missions at sea.

The *Forrestal* now had a serious misfortune; it was sabotaged by fire by a young sailor, causing \$7,000,000 worth of damage. Happily, the Portsmouth Navy Yard beat the repair doomsayers, and on 25 August the *Forrestal* began requalifying at sea with another Operational Readiness Evaluation.

On 22 September, four months after the Ghosts had left El Toro, their ship passed Gibraltar and came under the control of Commander, Sixth Fleet. Shortly afterwards, the squadron was gratified to learn that it had won the Chief of Naval Operation's Aviation Safety Award for 1972.

As flying began in earnest that fall, the Ghosts began to appreciate the full measure of skill, hard work, and harmony that was required to operate effectively and safely in the inherently hostile environment at sea. There was "the unending

and monumental task" of keeping aircraft free of corrosion in the constant salt spray. The high tempo of deck operations during launch and recovery left no margin for error. Both air and deck crews carried out their duties on the run.

The *Forrestal*, as many carriers, operated on a "very rigid one and one-half hour cycle time." This meant that a cycle began with the catapult launch of typically 24 to 28 aircraft. Precisely one hour and 30 minutes later, a similar number were launched. Only after these were airborne could the recovery of the first group begin. For daylight visual recoveries, aircraft were stacked abeam the ship at thousand feet intervals in sections or divisions.

Cloud ceilings modified the system, and the flight leader made an approach by TACAN down to daylight, visual conditions underneath the clouds, followed by a normal landing. Night and bad weather required a full instrument approach, using either the GCA talkdown method, or the automatic carrier landing system. Incoming flights were sorted by type and fuel state, handled individually on approach, and assigned a specific holding point and approach time.

Automatic carrier landings were still very much in their infancy in 1972, and often deficiencies in the ship's or aircraft's equipment prevented an easy daylight visual recovery. Night carrier landings were by common assent the most frightening part of carrier operations for the aircrews, and any system that aided in a safe arrival to arrestment was welcome indeed.

The pilots of -531 found the one-and-one-half-hour cycle time interfered with staying proficient in their air defense mission. After launch, the fighters were being flown at maximum endurance speeds to conserve fuel. Thus, ACM training with afterburning or high power settings was precluded. However, a lobbying push in late October by Major Howard L. "Lopp" DeCastro, the squadron's operations officer, enabled the Ghosts to be launched just before the previous cycle's recovery, engage either the returning flights or each other, and then follow them into recovery after a brief but intense flight. Close liaison with the ship's combat information center and the airborne early warning E-2 plane controllers enabled the Ghosts to come under their control from shortly after launch until recovery, thus permitting an airborne combat air patrol (CAP) during virtually 100 percent of flight operations.<sup>118</sup>

However, the control situation deteriorated

during periods when the ship suspended radio, radar, and TACAN transmissions to mask its position, as practiced during 12-20 November. Unlike USAF and USN planes, the F-4B had no self-contained navigation aid, and the E-2s could only give vectors to the ship. Nonetheless, by mid-December, the Ghosts were carrying out interceptions with relish against other Forrestal-based planes, in conditions of both communication and radar jamming. In other areas, the Ghosts found their aircraft radars could detect surface targets 35 miles away, and sometimes they even found some small vessels that the fancier ship and airborne radars failed to see.

New Year 1973 found the squadron fully integrated into shipboard life and missions. Ghost crews got to crossdeck and fly with a squadron from the Royal Navy's HMS *Ark Royal* in February, while VMFA-531 hosted two of their F-4Ks on the *Forrestal*. Then followed a combined exercise with the Spanish Navy and Air Force in the western Mediterranean during March. The exercise ended 30 March when the ship diverted to Tunisia to assist in flood relief. A third and final missile shoot in mid-April at sea near Crete was again entirely successful.

As the *Forrestal* did one last loop through the eastern Mediterranean, it conducted combined operations with Turkey in May. The squadron's final exercise of its tour with the Sixth Fleet occurred on 15 June. A three-day inspection then rated VMFA-531 "excellent" overall. Passing Gibraltar on 29 June, the Ghosts' thoughts turned toward home at El Toro.

On 5 July, as the carrier neared the Virginia coast, the 12 squadron Phantoms were catapulted off to make their way home. After the ship docked at Norfolk, the remaining Ghosts boarded Navy transports for El Toro. The 14-month deployment had been one of the longest for a Marine unit since the 1950s.

Even by the strict standards of naval aviation, the deployment of VMFA-531 on the *Forrestal* had gone extraordinarily well. Not only had the Ghosts carried out all their assigned tasks in the unfamiliar and demanding environment of carrier operations, they had done so in an innovative way, by introducing new tactics and exploiting the rapidly evolving capabilities of airborne early warning and control via datalink. The availability rate of the F-4B's aging radars and complex DECM gear had remained exceptionally high throughout, and the squadron had consistently

led with the highest missile firing rates. Its pilots were now all *Forrestal* "Centurions," with well above 100 arrested landings each. They had averaged 115 landings during the cruise, 26 at night, with Lieutenant Colonel Zych leading with a total of 129. Chief Warrant Officer-2 John "Condor" Bardon was the most experienced RIO overall, with 1,825 total hours. Most gratifying of all, in what was perhaps the most hazardous type of flying extant, there had been no accidents.

Such achievements did not go unnoticed. The squadron won its second successive CNO Aviation Safety Award. At a formal banquet on 28 September 1973, the Marine Corps Aviation Association presented its most prestigious awards to Ghosts. Major "Lopp" DeCastro was given the Cunningham Trophy as Aviator of the Year, while "Condor" Bardon was named Naval Flight Officer of the Year. Captain Louis E. Sergeant, Jr. was Air-Ground Officer of the Year, and Sergeant Ronald L. Harvin was Plane Captain of the Year.

#### *El Toro Home Interlude*

The next two years were somewhat anticlimactic as the squadron rebuilt at El Toro. On 26 July 1973, Lieutenant Colonel Michael P. Cady took command of the squadron. That day they heard the *Forrestal* wing commander compliment VMFA-531 as the finest fighter squadron he had worked with in 20 years: a high goal indeed for Ghosts yet to come!<sup>119</sup>

Now the unit reverted to its training role, as large numbers of the *Forrestal* veterans were transferred away. Scheduled maintenance was regulated by flight hours. Improved DECM radar homing and warning gear was installed. By late 1973, the squadron was again deploying to Yuma and engaging in dissimilar air combat training (DACT) with Navy fighters on the new air combat maneuvering range.<sup>120</sup>

On 29 March 1973, the war in Vietnam had ended with the Paris Peace Accords and the withdrawal of the last American troops. The later years of the war had seen an immense strain on morale in the Corps, which manifested itself in rising drug use and racial incidents. The Ghosts, like Marines everywhere, began participating in the Corps' innovative and experimental human relations program, which attempted to get Marines to see each other as individuals, rather than as members of any racial or social group.

The numbers on -531's roster also declined as

the Corps went through a postwar reduction in force. On 27 August 1974, the new commanding officer, Lieutenant Colonel John A. "Jack" Gagen, took charge of only 24 officers and 157 enlisted men, the lowest strength since 1947. Despite having only about 80 troops effective at any one time, -531 kept up its full range of activity of ACM, ordnance delivery, and missile shoots. In the last half of 1974 alone, the Ghosts had defensive air combat tactics (DACT) exercises with F-8s, F-14s, A-4s, and F-106s, in addition to intercepts in heavy electronic countermeasures against EKA-3s, EB-47s, and B-52s. They also flew the first trials of a new ground-based bombing radar.<sup>121</sup> One bright spot for the depleted squadron was the 1974 award of the Alfred A. Cunningham Trophy to Major Michael P. "Lancer" Sullivan, a veteran Ghost from Key West and Vietnam days.

The Marine Corps was finally moving to replace the elderly F-4B, now entering its 13th year of service. Serious signs of aging had now begun to appear. On 23 November, however, -531 accepted delivery of a reincarnated F-4B known as the F-4N. This new model was rewired and strengthened, and one key improvement was its visual target acquisition system for its Sidewinder missiles. The Ghosts appear to have been the first Marine squadron to use the system which made the Sidewinders much deadlier, especially when combined with the increased maneuverability given by the improved Sidewinder models.

The final F-4B flights were flown on 16 May 1975, just after the squadron passed 15,000 accident free hours. (The superior safety record of the Ghosts had again been recognized by presentation of the FMF Safety Award earlier in January.) On 10 June, Gagen took the flag to MCAS Beaufort, South Carolina, as VMFA-531 was reduced once again to cadre status in MAG-32, awaiting arrival of an exciting new plane, the F-14A. Plans changed, however, and the Marine Corps did not adopt the F-14A. Accordingly, the cadre was returned to El Toro 29 August 1975 as part of MAG-11.

As had happened several times before for -531, it was a case of starting all over. Gagen, the MAG-11's operations officer at El Toro, volunteered to leap into the breach and was again given command of the squadron. "We reformed from scratch at El Toro, without a screwdriver . . . or a screw for that matter," he later recalled.<sup>122</sup> The aircraft were F-4Ns just coming out of rework, and most

of the aircrews came from staff billets or the aborted F-14 training program. But, by early 1976, four captains had been pumped through the "Top Gun" school, and -531 was back in full operation. The squadron participated in an adversary exercise against the USAF's superb fighter, the F-15, and hosted the Navy's new adversary squadron. The F-15 was the most capable aircraft any of the Ghosts had ever come up against, and they felt the best they could hope for in a one versus one engagement was simply to survive.

After leading the squadron back from an advanced fighter tactics course at Tyndall AFB, Florida, Gagen handed the colors over to a distinguished Ghost alumnus, Lieutenant Colonel David G. "Yuma" Vest on 24 June 1976. His tour began with an unfortunate episode, for on 13 July a squadron F-4N was lost at sea on a routine training mission. The pilot and RIO were successfully rescued, but a proud string of five years and 19,330 accident-free flight hours was broken.

Vest now worked hard at introducing new tactics and techniques to keep the aging Phantom a potent weapon despite funding cutbacks. Over the next year the Ghosts worked on air-to-air gunnery, instrumented "loft deliveries" of conventional weapons, and new close air support tactics based on a sudden "pop-up" in altitude in attacking the target.

The "loft delivery" technique had been pioneered in Marine F-4s 10 years earlier in a Vietnam Marine fighter squadron of which Vest had been a member. The tactic involved a high-speed, low-level run-in from a visual or radar initial point. Using the F-4's Low Altitude Bombing System, the bombs could be lofted over four miles down range, thus keeping the aircraft out of the range of increasingly deadly close-in anti-air weapons. If the bomb was fitted with the new laser guidance head now coming into use, its final trajectory could be guided with pinpoint accuracy.

The new threat of anti-air weapons also required a revamping in the way the Marine Corps conducted close air support. No longer could close air support aircraft expect to survive circling the target and then rolling into attack, as was done in previous wars. At Yuma in September 1976, the Ghosts practiced a new form of close air support, using terrain to mask low-level approaches to the target. The FAC's brief now included a "time-on-target" to the nearest second. The attackers used a "pop-up" to gain

altitude, followed by only a few seconds of tracking time. Because pilots could never hope to distinguish their target in such a short span, their "pop-up" had to commence just as a target spotting mark, such as a white phosphorous mortar round or rocket, impacted. The process required exquisite coordination and timing, and therefore frequent practice as well. A 3d MAW evaluation done at Yuma at the same time rated VMFA-531 as "Excellent." This was due to the superior performance of all the squadron personnel, exemplified by the Marine Corps Aviation Association's 1977 Aviation Exceptional Achievement Award to Ghost veteran Lieutenant Colonel Ray L. Hanle, Jr.

Another type of simulated air war was the Air Force's Operation Red Flag, which worked on the premise that most pilots who were shot down in combat were lost before completing 10 missions. Red Flag attempted to provide these missions before actual combat, and the desert north of Nellis AFB, Nevada, was filled with assorted threat emitters and aggressor aircraft. Every action was meticulously recorded for often painful review later. Twenty-five Ghost crewmembers went through Red Flag 77-7 in June.

Vest's tour was capped by a formal review to verify actual weapons system performance in the field. All nine aircraft selected passed in what was described as the "most successful" review ever, a tribute to the ability of the Ghosts in keeping such an outdated aircraft going in its 17th year of service. On 1 June, another test of -531's "surge" capability for operationally ready/full system capability F-4Ns resulted in triumph, as an amazing 51 sorties were flown in only 11 hours with no cancellations. On 9 June 1978, Vest was succeeded by Major John A. Williams.

Captain James A. "Ratz" Ardaiolo later described Vest's tenure:

[He was] a great skipper who set the standards for the squadron to meet, and thus put in place the framework that led to the squadron's subsequent awards.

We all liked "Yuma," but he had a few idiosyncrasies that, of course as Skipper, he was entitled to. We always got a kick out of his meticulously briefed hops, particularly regarding taxi procedures. He frequently never got around to the tactics portion of the hop prior to "walking," but we sure knew how to taxi! . . . and of course RIOs



Department of Defense Photo (USN) DNSC851128

*With a squadron F-4 parked in the background, three crewman stand by with two tractors and a mobile electric powerplant during flight deck operations on the aircraft carrier USS Coral Sea (CV 43).*

were never to communicate with ground or tower control!

On a deployment to Yuma, AZ, a couple of sections miscalculated . . . and lofted 500 pounders, thankfully inert, towards a major road with an 18-wheeler crossing between targets. Somewhere there is a trucker who is still very "puckered up;" and [there was] the time after I was crewed with "Yuma" that we dropped a whole load of 500 lb. inerts at the IP [impact point] . . . when for some reason we got our switchology mixed up . . . I suggested on ICS [intercom system] that we not tell anyone, when over the air our wingman (telling the world) asked what that big cloud of dust was behind our plane?<sup>123</sup>

That fall there was a red letter day for the Ghosts. On 7 October, the Commandant, General Louis H. Wilson, Jr., gave VMFA-531 the Marine Corps Aviation Association's Robert M. Hanson

Award as the Marine Corps' top fighter squadron.\*

Williams continued Vest's work with a dual-missioned (ACM/DACT and ordnance/CAS) deployment to Yuma in November. Next came the staff planning for the aviation segment of a Combined Arms Exercise. On 1 December, the Ghosts arrived at the austere expeditionary airfield in the high desert at Twentynine Palms, California. For the first time a commanding officer of -531 was responsible for all aviation units of a Marine Amphibious Unit, including detachments of CH-46s, CH-53s, UH-1Ns, AH-1Js, OV-10s, and A-6Es, some 600 Marines in all.\*\* Not only did Ghost crews act as the aviation staff, they also flew day and night close air support missions in a simulated high threat environment using "pop-up" tactics. The fast paced exercise

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\*See Appendix F for citation.

\*\*Marine Amphibious Units (renamed Marine Expeditionary Units in 1988) were the smallest of the Marine Corps' task forces. MAUs centered on a battalion landing team, combined with a composite squadron, and a service support element.



VMFA-531 WestPac Cruise, 1979-1980

*Following a mission brief, aircrews suit up and proceed to the aircraft for a possible "Goldilocks" alert or routine mission launch.*

was intended to weld a mechanized Marine force together in order to fight successfully in a difficult desert warfare scenario.

Quite coincidentally, the climate and terrain at the exercise was remarkably similar to that of Iran where an Islamic revolution had recently taken place. Returning to El Toro, the Ghosts learned they had been selected for sea duty in 1979 on board the *Coral Sea* (CV 43), along with their sister MAG-11 squadron, VMFA-323.

#### *The Indian Ocean on the Coral Sea*

Early in 1979, the squadron began to stabilize for carrier duty. While keeping up the full gamut of missions, including some of the largest ACM engagements to date, the Ghosts cranked up an intense field carrier landing program and began the training of two landing signals officers. One helpful aid to carrier landings was Miramar's simulator with a computer generated visual display of a carrier deck at night and full control and landing equipment. It was now possible for pilots to get used to some of the sensations without the terror that surrounded actual operations.

In February, -531 qualified on the *Kitty Hawk*. This was followed by two weeks of training with the various other squadrons of Carrier Air Wing 14 (CVW-14) at NAS Lemoore, California. The conclusion of that intensive fortnight was later described by Ardaiolo:

Some Navy staffer thought it would be a great idea to have an air wing dinner to get us together and to celebrate our accomplishments. At the head table were the CAG [carrier air group] staff and the visiting MAG-11 CO. The squadrons sat at long tables perpendicular to the head table. At the outside tables were VMFA-323 on one side and -531 on the other, with all the Navy squadrons in between.

That arrangement was a tactical error and an invitation for fun, which none declined. Shortly after dinner commenced, the dinner rolls started to fly, followed by prime rib bones, baked potatoes, and anything else we could lay hands to, including fire extinguisher contents. CAG asked "Zorro," the MAG CO, if he could stop the melee, who

reportedly said he could, but, under the circumstances, didn't think that would be a good idea!<sup>124</sup>

Surviving that episode, the squadron had its first carrier qualification flights on the *Coral Sea* on 27 March. There was a total of eight brief deployments to the ship, plus others to Lemoore and El Centro. Later, VMFA-531 and -323 hosted a special visitor, former Ghost AIO/RIO, now-retired Captain Eugene S. "Mule" Holmberg, who briefed the squadrons on the Iranian Air Force. He had just returned from Iran after having spent three years there as a civilian F-14A flight instructor. In addition, several crews got to fight the USAF's new, super-agile, clear-air-mass fighter, the F-16, at Hill AFB, Utah. Other developments included introduction of the latest and most deadly model of Sidewinder yet, known as the "Lima" or AIM-9L.

On 31 May 1979, one of the Corps' most expe-

*Armed with Sidewinder and Sparrow missiles, an F-4N Phantom II is launched from the Coral Sea (CV 43).*

rienced carrier pilots took over to lead -531 for the *Coral Sea* cruise. He was Lieutenant Colonel Gary R. "Jinx" Braun, a veteran of 360 combat missions, who had also accumulated some 400 carrier landings on earlier cruises, dating back to 1965. Leading the sister squadron, VMFA-323, was Ghost alumnus and old carrier hand, Lieutenant Colonel David V. "Hook" Denton. For the first time since the Korean War, Marine fighter squadrons would be responsible for the airborne defense of a carrier battle group. The Marine team proved to be an effective combination. Braun later thought the reason for picking Marines with 17-year-old planes was due to the Navy getting "caught in a squeeze for manning their smaller CVs during the transition to F-14s. The F-4Ns were 2,000 to 3,000 pounds lighter than the F-4J, which also helped, as did the ship's aircraft intermediate maintenance department being geared up for Phantoms earlier."<sup>125</sup>

In the last half of June, the squadron under-

Department of Defense Photo (USN) DSN9300837



went both Marine Corps combat readiness system and 3d MAW inspections. The readiness score of 92.4 percent was the highest yet recorded for an F-4 squadron. The Ghosts had now stabilized at 35 officers and 217 men, in addition to the 12 F-4Ns they would take on the deployment. Their superior maintenance and operations were reflected in an 8 August receipt of the Chief of Naval Operations Safety Award.

The period up to the ship's departure on 13 November was crammed with more "carquals," mission training, electronic warfare training at China Lake's Echo Range, and missile shoots, including the first of the improved, extended range Sparrows to be fired in the fleet. Three crews meanwhile completed the "Topscope" class at Miramar, while two more took the "Top Gun" course. There was also low-altitude tactics training, which was conducted against A-4 adversaries at up to 600 knots and 6 Gs at very close to zero feet altitude over the desert floor. For the aircrews involved, these were likely the most physically debilitating and dangerous flights in the syllabus.

The pilots flew their F-4Ns to NAS Alameda, California, in the second week of November, and the planes were then lifted by crane on board the *Coral Sea*. As the ship departed for its first stop at Pearl Harbor, the taking of about 100 hostages by fanatic students at the American Embassy in Teheran, Iran, captured the attention of all Ghosts, as it did all Americans. Then it was announced that the United States would not rule out use of force, and the *Coral Sea* was sent on its way after only four hours of replenishment at Pearl.

As the ship steamed north of Guam on 28 November, it detected a large airborne target approaching the ship. The Marine fighters were duly scrambled and had an uneventful intercept of a Soviet Tu-95 "Bear" maritime reconnaissance bomber. After stops in Korea and the Philippines, VMFA-531 welcomed 1980 with a January dissimilar air combat maneuver against RAF and Republic of Singapore Air Force planes. For one day the ship set aside its rigid 1:45 cycle time in favor of "hot cycling/hot decking," to generate maximum effective air defense sorties while operating 50-100 miles northeast of Singapore. This was followed by four welcome days of liberty ashore.

Leaving Singapore, the *Coral Sea* headed into the Indian Ocean, and then, in a change of plans,

it was ordered to rendezvous with the *Nimitz* (CVN 68) on Gonzo Station, about 100 miles off the eastern tip of Oman in the Arabian Sea. From Gonzo, surveillance, and control if necessary, of the Gulf of Oman and the narrow and strategic Strait of Hormuz about 350 miles northwest could be carried out, while still leaving plenty of sea room for maneuvering.

The Ghosts now dusted off their notes from "Mule" Holmberg's brief nine months earlier. Iran's air force was made up of the remnants of the Shah's elite Imperial Iranian Air Force. A year earlier, the Iranians had a substantial number of modern fighters with excellent radar, in addition to an effective maritime surveillance force, as well as GCI radar and improved Hawk surface-to-air missiles surrounding the major airfields. Along with ship-launched Harpoon and Exocet missiles, these forces constituted a significant threat to the battle group. It would be the task of the two Marine squadrons to defend the *Coral Sea* against any such threat. No one imagined at the time that they would be doing it for a record 102 days of "blue water" operations.

They would now strive to keep a continuous CAP of two F-4s each aloft over the battle group by day. This was continued through the night at first, but it led to a strain on resources and manpower, so the two squadrons alternated for one two-plane launch per cycle. The 1:45 ship cycle time meant that much of each F-4 flight was spent at maximum endurance levels. This put a crimp in ACM proficiency, so most crews got only two ACM flights a month. All Ghosts realized that this "Force CAP" (combat air patrol) was for real, as was the fact of "blue water" operations—without a viable airfield on land for diversion in an emergency. The ship worked an eight-day cycle: six straight days of flight operations, followed by a one-day stand down for all flying units, and then a day of maintenance. The cycle was phased with that of the *Nimitz*, so that the task force would always be covered.

Combat air patrols at times ranged into the 40-mile wide Strait of Hormuz itself. These were still international waters, but barely so, and the Ghosts had to watch their positions carefully. Interceptions were carried out against the Soviet reconnaissance bombers that came over regularly. On one occasion, the Ghosts were engaged in a barbecue with soda pop refreshments on the "steel beach" of the flight deck, when all hands were startled to see assorted *Nimitz* aircraft parade



Department of Defense Photo (USMC) DMST 8207625

*During a practice run, an F-4 Phantom II drops a napalm canister on a desert training range.*

overhead in an attack demonstration, followed immediately by two flights of Soviet Tu-95s at 500 feet escorted by F-14s "just like a damn airshow," Braun later commented.<sup>126</sup>

On Gonzo Station, the Marine squadrons practiced tactics worked up to counter anti-ship missiles. Harpoons and Exocets, which were carried on Iranian naval vessels, were a most worrisome threat. If their launching platforms could not be dealt with in time, the next line of defense was for the Marines to detect and bring down the small, sea-skimming missiles. This was a tricky exercise, since the F-4N lacked moving target indicators which could separate the missile from masking sea and ground returns. In addition to working in two battle group exercises with the Nimitz in mid-March and mid-April, the Ghosts provided fighter cover in a minelaying exercise with B-52s of the Strategic Air Command.

As the patrolling at Gonzo wore on, the ship shared a national sense of agony and impotence over the fate of the 53 remaining American hostages held in Teheran, who were mostly fellow Marines from the security guard. The Ghosts could not know of steps being taken to rescue the

hostages in a daring and complex plan which would involve them.

In the third week of April, Braun and other commanding officers were flown over to the *Nimitz* for a briefing on the proposed rescue operation and possible punitive air strike. A series of actions had been designed to get the hostages and bring them to an airfield called Manzariyeh, 40 miles from Teheran. To protect the evacuation transports, President Jimmy Carter had ordered, "There will be air cover from Manzariyeh all the way out of Iran."<sup>127</sup>

Accordingly, the *Nimitz* was to provide very long-range (some 850 miles from the ship) fighter cover near Manzariyeh. The F-4Ns of VMFA-531 and -323 would initiate CAP over an Iranian airfield about 340 miles away from the ship, to prevent any threat from that quarter. President Carter canceled the air strike on 23 April, and then the helicopter operation turned into a disastrous failure at a secret refueling site in the Iranian desert after a ground collision between two of the rescue helicopters in severe blowing dust.

As these events were unfolding, the regular -531 CAP orbited near the ship, while the other

crews awaited orders that never came to launch for the Iranian airfield. Few Ghosts slept that night, and at about 0400 the next morning word was passed that the rescue mission had failed.

The final patrols occurred a few days later as the Ghosts escorted some outbound Navy supply ships through the Strait. Finally, on 9 May, the *Coral Sea* arrived at Subic Bay in the Philippines after 102 days at sea. Soon the ship turned home-wards. Off the California coast, 12 ancient and weary -531 Phantoms were catapulted off a last time for El Toro.

The memories of that cruise would always remain vigorous in the minds of the Ghosts who were there. Again, Ardaiole recalled:

The long days on alert in the Indian Ocean; the many acey-deucy tournaments; the huge storm that damaged so much aboard ship; the first intercept of Russians coming to look over the task force by our most junior crew, causing some consternation amongst the Navy, which was used to sending their most senior guys out to say hi to the Commies; the long hours at work by all the squadron Marines . . . the very dan-

gerous flying conditions aboard the ship—CAG lost five aircraft, one of [- 323's] Phantoms slid off the deck into the ocean while being towed with one of our maintenance personnel in the cockpit riding brakes; our Marine was rescued; on another occasion one of our aircraft, with engines turning, loaded with live missiles during a hot aircrew change, broke its chains and slid into the catwalk rupturing the centerline tank, nearly creating a major catastrophe.

The war footing we went on during the Hostage Crisis in Iran; flying CAP to protect the ship and task force; planning strikes into Iran should it had become necessary; the "This is no drill" battle stations we went to the morning of the aborted rescue mission into Iran.<sup>128</sup>

In a broader evaluation, the failure of the Iranian rescue mission would necessarily mute what had otherwise been a triumphant deployment on the *Coral Sea*. The Ghosts had accomplished all their challenging missions in exemplary fashion in the difficult and hazardous conditions of "blue water" operations of unprece-

*At Marine Corps Air Station, El Toro, a squadron Phantom is maneuvered into its parking space.*

Department of Defense Photo (USMC) DMST 8304059





Photo courtesy of Maj William Henson, USMC, USMC

*A -531 Hornet roars off the runway for a close air support mission in February 1984.*

dented duration. All crews went well past the 100 mark in carrier landings, and most made 150-160 of them on the cruise, with -531 totaling 1,163 day and 588 night landings. There had been no real accidents in these venerable Phantoms. Availability had been superb thanks to diligent round-the-clock maintenance. Had the necessity arisen on 24-25 April, the squadron crews would no doubt have rendered a good accounting of themselves in combat, due to the superior state of their training and readiness.

For their contribution as part of CVW-14, the Ghosts were included in a Meritorious Unit Commendation and awarded the Marine Corps Expeditionary Medal, the first time the latter had been awarded since 1964.\* The squadron also won the prestigious Commandant's Aviation Efficiency Trophy with a citation that noted the Ghosts, while on board the *Coral Sea*, "led the wing in mission capable rates."

#### *El Toro Again: Enter the Hornets*

After short leaves, the Ghosts were quickly back at work with electronic counter-counter-measures training against USAF planes in mid-July, a MAG-11 missile shoot in early August, and a deployment to Yuma in September. In between

were detachments for DACM at Eglin AFB, Florida, Luke AFB, Arizona, NAS Fallon, Nevada, and Yuma. On 15 November 1980, the squadron was saddened by the loss of First Lieutenant Peter Rabeziwaki, when his ejection seat was fired accidentally while on the ground at Sheppard AFB, Texas. It was the first death of an aircrew member since 1969.

On 11 December, the dynamic and able Braun was succeeded by Lieutenant Colonel John L. Vogt. The new commanding officer was faced with a large turnover of many of his key officers and enlisted men, in addition to an influx of five brand-new crewmembers.

After hosting four "Top Gun" instructors, two of whom were former Ghosts, the squadron deployed for a Red Flag exercise at Nellis in February 1981. There they acted as aggressors, an ideal training situation since the syllabus required many DACM/DACT sorties.

The Ghosts had now passed 15,000 hours and four years free of flying accidents. However, the Phantom again began showing its age when the Navy limited it to four Gs in July, until an extensive wing structure inspection was carried out. This was finished in time for a deployment to Hill AFB, Utah, to fight USAF F-16s and F-105s in October. "Carquals" on the *Ranger* (CV 61) rounded out 1981, and Lieutenant Colonel Robert R. Renier, a Ghost veteran of the *Coral Sea* cruise, took over on 18 December.

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\*See Appendix F for full citation.

The year 1982 saw the squadron complete a remarkable 20 years of service in Phantom IIs, which now truly deserved the term, "antique." There was no letup, however, as the Ghosts deployed to the Marine Corps Air Ground Combat Center, Twentynine Palms, and then another two weeks at Tyndall Field in April. The F-4's swan song was a Red Flag exercise in the August heat of the Nevada desert, under a new commanding officer, Lieutenant Colonel James L. Lucas, who had taken charge on 10 July. There was not a single ground abort or maintenance cancellation during the two-week exercise.

On 1 October, the squadron assumed non-operational status, although tactical flights would go until late November. Fittingly, most of the last sorties were DACM against the top fighter models of the other Services. "The end of an era . . . was noted with great pride that at precisely 0800 on 24 November the last eight F-4Ns of VMFA-531 departed on their last flights as part of MAG-11 and 3d MAW," the Commanding General, 3d MAW, commented in his farewell message.<sup>129</sup>

Now Lucas and the Ghosts would concentrate on the introduction of one of the most versatile aircraft ever to enter the Marine Corps' inventory, the McDonnell-Douglas F/A-18 Hornet.

Like many of its predecessors, the F/A-18 came to the Marines by a convoluted path. After the Marine Corps' elimination of the F-14 program, it was put in a difficult situation for a future fighter/attack aircraft. To get maximum flexibility, the Marines needed an aircraft that could perform both missions well.

One stopgap was the rebuilding of F-4Js into F-4Ss with maneuvering slats for improved turns, smokeless engines, and a digital version of the previous radar with a crude heads-up display. This was the best air-to-air Phantom ever made, and it would serve in the Fleet Marine Force (FMF) until 1989. The only other candidate was an evolution of the Northrop YF-17 twin-tailed, twin-engined fighter. McDonnell Douglas and Northrop agreed to joint production of a carrier-capable version, and it was designated as the F/A-18A Hornet.

*A KC-10 tanker refuels a squadron Hornet on the long flight to Egypt in July 1985.*

Photo courtesy of 1st Lt Wesley Johnson, USMC



Although the Hornet would subsequently receive some (undeservedly) bad press as to its range and top speed—it was slightly slower than the F-4N—its good points were almost overlooked. They were many: superior agility, an advanced radar (the APG-66) with all flight and radar information projected onto the windscreens by a heads-up display, a high speed 20mm gun with a state of the art gunsight, and an improved bombing system with less dispersion.

The first Ghost pilots and maintenance people to become acquainted with the exciting new plane traveled up to NAS Lemoore, California. Lucas and his pilots were all back at El Toro by mid-July, having completed training in four and one-half months. The formal training program had been designed with individual programmed learning blocks and a full capability simulator. The latter was exotic enough to dramatize air-to-air visual combat in a domed enclosure, where the pilot sat in his cockpit and could "fight" various adversaries such as the MiG-21. These were projected onto the spherical screen along with terrain, horizon, runways, carriers, and clouds. To add even more realism, missile firings left a smoke trail and made a satisfying explosion when they contacted an "enemy."

The transition training went so well that MAG-11 directed that delivery of the first F/A-18 for VMFA-531 be moved up. On 8 June 1983, flight operations began with the Hornet at El Toro. At the end of August, all 12 Hornets were on board and the unit had stabilized at 22 officers and 250 enlisted men. Almost immediately, the Ghosts were in the thick of advanced tactics training against the Navy's adversary squadron and "Top Gun" planes from Miramar.

The introduction of the F/A-18 was ahead of schedule that the squadron now found itself short of flying funds. Even so, Lucas was able to scrape enough together to take six Hornets, 10 pilots, and 70 men to CFB Cold Lake, Alberta, Canada, to participate in Maple Flag XII on 10-24 September. The Ghosts were the first FMF unit ever to take part in this multi-national exercise, which was modeled on Red Flag with a European scenario. At the same time -531 sent the first two FMF Hornet pilots to attend the "Top Gun" course.

In October the new fiscal year began, and the squadron promptly flew a detachment to Hill AFB to fight Air Force F-16 Falcons. Here the Ghosts could take the measure of their new plane. They found that the F/A-18 was nearly as maneuverable

as the Falcon, but had a distinct edge in weapons effectiveness with its Sparrows, Sidewinders, and 20mm guns.

Besides its sparkling performance, the F/A-18 would prove to be a quantum leap in reliability and "maintainability," compared to the Phantom. There was, however, a problem area with the failure to field a DECM package for the Hornet, so Phantom-era gear eventually had to be installed.

Overall the safety rate of the Hornet was turning out to be about three times better than the best year of the Phantoms. This was due to the aircraft's smooth handling characteristics, simplicity of operation (once the unfamiliar computers and information display were mastered), and the quality of initial training provided by the replacement training squadrons from the fleet.

At the end of November, -531 was visited by a legendary former commanding officer, a long-retired brigadier general named Harshberger. "Iron John" could not help but be impressed that at last there was an all-weather fighter that was as capable by day as it was at night. It had been a long, difficult road from the original PV-1!

Lucas was succeeded on 16 June 1984 by Lieutenant Colonel Manfred A. "Fokker" Rietsch, a colorful and aggressive fighter pilot with more than 600 F-4 combat missions in his logbook.\* The Ghosts would now continue with an unusually high "full mission capable" rate of 90.7 percent during some challenging deployments. Red Flag in August was followed by another detachment to the USAF Aggressor School also at Nellis, and then on to serve as Marine participants in a practice operation which included long endurance missions with aerial refueling.

In late September, the squadron received a visit from the most senior former Ghost, Lieutenant General Keith Smith, who, as the Marine Corps' Deputy Chief of Staff for Air, sized up the unit for an interesting mission in 1984. He also congratulated Gunnery Sergeant Edward G. Robinson on winning the Marine Corps Aviation Association's Aviation Electronic Technician Award. In the tradition of Jack Bardon, Robinson had played a key part in keeping the Ghost Hornets' full-mission capable rate so high.

In April of 1985 Rietsch was notified that he

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\*Rietsch would later command the largest air group ever fielded in combat in Operations Desert Shield/Desert Storm in 1990-91, flying 184 combat missions himself.



Photo courtesy of Col Robert F. Foxworth, USMC  
*F/A-18 Hornets of VMFA-531 overfly the pyramids during the July 1985 deployment to Egypt.*

would lead VMFA-531 in the first Marine long-range deployment of the F/A-18 as part of a joint exercise. The Ghosts would become the first Marine squadron to deploy to a land base in the Middle East at Inshas, Egypt, about 30 miles north of Cairo. Lieutenant General Smith intended that this be an exercise to see if the Hornet could operate from an austere base without intermediate level maintenance support. Inshas easily met the requirement for such a bare base.

For the 6,700-mile deployment, 10 Ghost Hornets flew non-stop in late July to NAS Oceana, Virginia, using aerial refueling from Marine KC-130 tankers. After a short layover, they made the long 3,200-mile jump across the Atlantic to Spain in two flights of five Hornets, each of which had its own widebody USAF KC-10 tanker. Then the squadron flew independently in two legs to Inshas via Sicily. Once in Egypt, it was under USAF control and had to follow a rigid pre-planned schedule.

Inshas turned out to be like an oven, with daily temperatures up to 115 degrees. Line crewmen wore head covers, sun goggles, and neckerchiefs reminiscent of Rommel's Afrika Korps. The weather turned out to be surprisingly poor for a

desert setting, with visibilities sometimes less than a half-mile in haze, fog, smoke, and dust in the morning. Although the field had a TACAN, it was unreliable, and at times the Ghosts found their multi-million dollar Hornet assets grounded for lack of a precision approach aid. What weather information there was to be had came from Arabic newspapers and radio stations.

Standard military jet fuel was not available, so kerosene-based commercial fuel was used. This gave the Hornet's engines no problems at all, and greatly mitigated the logistics problem of having to supply a particular military fuel. Another bonus was that, with the F/A-18's self-contained starting system, no auxiliary air starters or electric units were needed to launch. The full-mission-capable rate was also extremely high. Only 3.3 manhours of maintenance were required for each flight hour—an unimaginable statistic compared to the Phantom. As a result, the commanding officer could schedule all of his aircraft to be airborne at once, if he so chose, thus greatly multiplying the effect of his force.<sup>130</sup> Rietsch often so chose: "I never had an airplane down for more than five hours, and every one we had flew at least twice a day."<sup>131</sup>

There was a single manager of all air assets—the USAF—and for the Marines the greatest problem of this system cropped up in close air support. Of 30 such sorties, only eight were flown with a forward air controller, and the full close air support system was used only once. Clearly, close air support did not rank high in USAF priorities.

Hornets from -531 also provided fighter escort for A-6s and A-7s off the carrier *Nimitz* (CVN 68) in a fine display of their dual mission capability. From Inshas they would fight F-16s, Dassault Mirage Vs, and MiG-21s. One encounter involved 6-8 Ghost Hornets against 12-14 well-flown MiG-21s, whose pilots included some veterans of the Arab-Israeli wars. Most of the participants felt this alone was worth the trip.

The Secretary of the Navy, John Lehman, in an official Letter of Commendation to VMFA-531, said that the Inshas deployment "was flawlessly executed . . . [in] demanding and complex air-to-air and ground missions . . . The Squadron displayed to all commands involved in the exercise the reliability, force projection, and sparse logistic requirements that a Marine F/A-18 aviation unit can provide to any potential battlefield."<sup>132</sup> These were prescient words: Marine Hornets—many flown by former Ghost pilots—turned in a superb performance in the Gulf Conflict of 1990-91.\*

Returning home in mid-August 1985, the Ghosts did not stay put for long. There was a deployment to Hill AFB in October to fight the F-16s again, and two weeks at NAS Key West to perfect the art of air-to-air gunnery.

The F/A-18's 20mm six-barrel revolving cannon was a USAF development, and it was easily the best aerial gun ever used by the Corps. Gunnery was done with the radar and the heads-up display against the traditional banner which was towed. The pilot locked his radar onto the banner, which now appeared on the display. When a flashing "shoot" light from the computer indicated a good firing solution, the pilot fired anywhere inside of a 2,000 feet range, usually in a one-second burst at up to 6,000 rounds per minute. In 247 sorties and 49 missions, the Ghosts fired 61,185 rounds. The percentage of hits rose from 6.7 percent to 17.2 percent by the end. This was probably the best shooting in the squadron's history and, indeed, a skilled gunner

could work his percentage up to 35-50 percent or more with practice.<sup>133</sup>

In March 1986, after 10 days at Yuma for air-ground ordnance training, -531 went back to Nellis for a Green Flag exercise (similar to a Red Flag, except it was run in a more sophisticated electronic environment). Rietsch complained that new restrictive rules of engagement prevented the Ghosts from conducting interceptions below 13,000 feet and "allowed only intercepts against adversary aircraft which were outnumbered by the F-18s." Thus he considered the training value of this Green Flag to be marginal. A complete lack of defensive electronic countermeasure gear was another negative.<sup>134</sup>

This was not the case in the deployment to Tyndall the next month; there the squadron flew 90 percent of its flights against adversaries from six USAF units "in our most valuable and cost-effective air-to-air training deployment [yet]."<sup>135</sup> Rietsch's last deployment with -531 was to Kingsley Field, Oregon, the site of a large USAF F-4 training operation for Air National Guard pilots. Like the Marine Corps Reserve, these pilots were more experienced than the regular forces on average, and they gave the Ghost Hornets a good workout in air defense tactics.

On 26 June 1986, Rietsch was succeeded by his executive officer, Lieutenant Colonel James L. Cieslak, a veteran of Inshas and many other Ghost deployments. This was in keeping with a new Marine Corps policy of having executive officers move up, in order to eliminate having a commanding officer who was not familiar with the unit or fully trained in the aircraft.

Cieslak was soon leading four Hornets on a mysterious mission to NAS Adak, Alaska, located on a desolate island about three-quarters of the way out the Aleutian chain. The ostensible reason for the detachment was to support a Marine landing exercise, and the Ghosts did do some GCI work with the task force. But the real reason was to fly actual barrier combat air patrols between Attu Island (the western most of the Aleutians) and the Soviet Union's Komandorskiye Island, while a U.S. Navy cruiser did some testing of the new Tomahawk sea-launched cruise missile eastwards along the chain.

This was followed by a deployment to the other end of the weather spectrum: El Centro, California, in August. There VMFA-531 served as the offensive air unit in a brigade-sized amphibious exercise. Then, in October, the Ghosts flew to

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\*See Appendix F for full citation.

# Brigadier General Keith J. Stalder

Keith J. Stalder was commissioned a second lieutenant after completing Officer Candidate School in 1973. He graduated from the Basic School and was designated a naval aviator in February 1975. Assigned to further flight training with VMFAT-101 at Marine Corps Air Station, Yuma, Arizona, he received his designation as an F-4 pilot.

After initial F-4 training, he was assigned to Marine Fighter Attack Squadron 333, Marine Corps Air Station, Beaufort, South Carolina. He deployed on board the *Nimitz*, Carrier Air Wing 8, until February 1977. He was then transferred to Marine Fighter Attack Squadron 235, Marine Corps Air Station, Kaneohe, Hawaii, in May 1978. While assigned to VMFA-235, he made several deployments as well as attended the Weapons and Tactics Instructor Course.

Following these tours, he reported to VFA-125, Naval Air Station, Lemoore, California, to fly the F/A-18 Hornet. He remained with VFA-125 as an instructor pilot until August 1984 and attended the Marine Corps Command and Staff College, Quantico, Virginia, graduating in June 1985.

He was next assigned to the 2d Marine Aircraft Wing to become the aircraft maintenance officer of Marine Fighter Attack Squadron 115 in Beaufort. While with VMFA-115, he made a number of deployments to Europe and the Far East. In early 1988, he was transferred to Marine Aviation Weapons and Tactics Squadron 1, Marine Corps Air Station, Yuma, as the operations officer.

In June 1990, he was assigned as the Commanding Officer, Marine Fighter Attack Squadron 531, 3d Marine Aircraft Wing, El Toro, California, deploying to WestPac in 1991. At the completion of this tour, he attended the

Tinker AFB, Oklahoma, to act as adversary air against USAF F-15s and F-16s.

The fast pace continued into 1987 as the squadron prepared intensively for its first WestPac duty on land in 22 years. There also was a steady stream of deployments: El Centro, Yuma, Point Mugu, Hill AFB, Miramar, and Kingsley Field. At

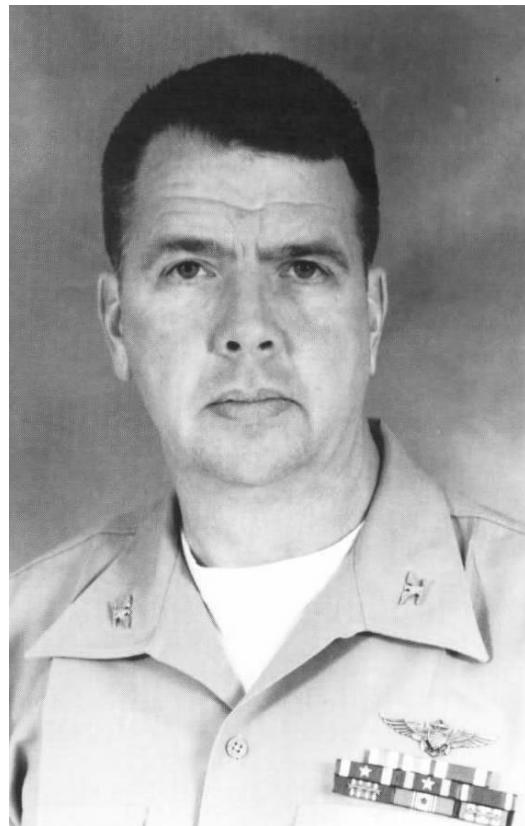


Photo courtesy of Col Keith J. Stalder, USMC  
*Then Col Keith J. Stalder.*

NATO Defense College in Rome, Italy, then reported to Headquarters, European Command, Stuttgart, Germany. There he served as the operations division chief for the military-to-military contact program for Central and Eastern European and the former Soviet Union.

Returning once more to Yuma, Colonel Stalder served as the commanding officer of Marine Aviation Weapons and Tactics Squadron 1. Promoted to brigadier general, he became Assistant Wing Commander, 3d MAW, in 1998.

Fort Hood, Texas, the Ghosts provided night deep air support to the Army, using laser and forward-looking infrared target designation and acquisition. All of these deployments were in the first six months of 1987, in what was supposed to be a "garrison" training stage.

The second half of the year was more of the



Department of Defense Photo (USMC) DMST 9300334

*PFC Dwayne Dickey, plane captain, signals to 2d Lt Troy D. Kehoe in an F/A-18A Hornet as the squadron made its final deployment to Marine Corps Air Station, Yuma, in early 1992.*

same. The squadron did another Red Flag, and then 10 days of aerial gunnery off Point Mugu, besides sending pilots to "Top Gun" courses. In October, the Ghosts operated from an expeditionary airfield in support of a large exercise while living under canvas. This was to be excellent practice for what would soon come in Korea.

In November, a detachment was sent to Miramar for DACM. On the 17th, one of the rear echelon F/A-18s was operating over water when the pilot, First Lieutenant Thomas A. Drechsler, then heard the computerized female voice warning: "Engine fire left! Engine fire left!"\* After his wingman confirmed he actually had a fire—in fact it was a catastrophic engine failure—Drechsler ejected and splashed down in the chilly Pacific Ocean. By great fortune, a Navy helicopter located him in the moonless dark.

There had been several other mysterious engine fires in the F/A-18, which marred its otherwise superior safety record. The ensuing

engine and airframe modifications put a distinct crimp in flight operations in the spring of 1988. Before Cieslak could lead his dozen Hornets to the Far East, "we first had to rebuild the airplanes. I mean we had to change every engine, every stabilator, and every [leading edge flap]. It took three months."<sup>136</sup>

Finally, on 19 April 1988, the Ghosts made the TransPac trip, with KC-10 aerial refueling, via Kaneohe and Wake Island, arriving at Yechon AB, Korea, on the 24th. This was the first VMFA-531 participation in the Marines' unit deployment program (UDP), in which units were sent overseas for two six-month periods with a year in between. These UDP deployments were phased with ground units for maximum cohesiveness. And with numerous stateside deployments a way of life for many squadrons, this was also one way of cutting down on lengthy family separations.

Yechon was an austere base in Korea. Here the Ghosts would spend their longest period under canvas since World War II, living in a left-over tent compound. For the first time on an overseas tour, women would be part of VMFA-531. Captain Jo A. Bell, a maintenance specialist,

\*The computerized voice warning system was universally dubbed "Bitching Betty" by F/A-18 pilots.

was the senior woman on board. Other female Ghosts would perform any and all of the VMFA occupational specialties, including physically demanding jobs such as ordnance loading. However, women were excluded from aviator MOSs during this time, because the Marine Corps was not authorized to use women on board ship.

The early months at Yechon were a trial, with below freezing temperatures and—later on—monsoon rains, but the squadron learned to live on sandbags and pallets to keep dry. Parts resupply was another problem, since the USAF logistics plane landed some 80 tortuous road miles away. As usual overseas, there were many flying challenges in DACT with Korea-based planes, in air-ground ordnance delivery on nearby ranges, and in simulated close air support near the Demilitarized Zone with controllers in USAF OV-10s.

The highlight of the WestPac tour was a one-month detachment to Thailand to participate in an exercise beginning in early July. Cieslak led his flight of six Hornets via Cubi Point and then across the South China Sea with refueling help. Unlike the last Ghost flights over these waters, navigation was not a concern, thanks to the F/A-18's highly accurate inertial guidance system. The Ghosts were billeted at the barracks of the Royal Thai Marine Corps, a unique chance to meet and live with Marines of another country.

The exercise included both air defense and offensive missions in support of the 15th MEU.\* The squadron flew numerous DACT missions with F-16s and F-5s. Unfortunately, the Hornet's engine problems were by no means over, and another sudden failure struck again on 26 July over Thailand. First Lieutenant David J. Schmarr handled the emergency perfectly, and was able to land his plane safely, saving the aircraft.

VMFA-531 now returned to Cubi Point, where it left four Hornets for a month's worth of defensive ACM training. Cieslak made sure the duties for all Ghosts were rotated, so that everyone could get a chance to operate in various locations. On 7 October, the squadron turned their Hornets over to VMFA-323 and flew home on a chartered plane to El Toro. Once again the Ghosts had

demonstrated their ability to operate effectively from a forward base with minimal support.

On 27 October 1988, Cieslak concluded his 28-month tour as commanding officer—the longest of any Ghost skipper—and handed over the colors to his executive officer, Lieutenant Colonel John F. "Hustler" Goodman, a former U.S. Army infantryman with a Bronze Star and Purple Heart from Vietnam. Goodman would now take -531 through the workup for a second deployment to WestPac. In July of 1989 the Ghosts passed the first part of their readiness tests, and then deployed for two weeks at McChord AFB, Washington, for DACT with a USAF squadron in August. In September there was a no-notice missile shoot to complete their readiness tests.

#### *Back to WestPac*

On 3 October 1989, the Ghosts embarked once again for WestPac in 12 Hornets via Kaneohe and Wake. They arrived at Iwakuni, Japan, and were immediately tasked with close air support missions in a practice exercise. In late October an eight-plane detachment went down to Kadena AB on Okinawa for a joint USAF-USMC air defense exercise. On 28 November, the Ghosts passed six years and 34,000 hours free of chargeable flying accidents, an enviable record for a fighter attack squadron.

Then, on 15 December, 12 of the squadron's Hornets took off from Kadena. Thus, the new year of 1990 found the Ghosts practicing air-to-air gunnery at Cubi Point, where they had been 10 years earlier. That was coupled with DACT for a two-week period involving USAF and Navy pilots. Returning to Iwakuni on 1 February, the squadron participated in a variety of missions; more DACT, armed reconnaissance, fighter escort, "war-at-sea" scenarios, simulated airfield attacks in Korea, and mine laying.

Moving into March, -531 carried combat loads of missiles and 20mm ammunition in a series of "intercept and escort" missions with snooping Russian bombers. The Commander, U.S. Seventh Fleet, sent congratulations: "well done for exceptionally professional intercept and escort services . . . Your 100 percent on station reliability and timely intercept of all real world contacts provided valuable protection to the battle group. . . . The Marines have flown, and the situation is well in hand."<sup>137</sup>

Another Ghost milestone was passed on 15

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\*The term "expeditionary" was reinstated in Marine task force designations, replacing "amphibious." MAUs now became MEUs (Marine Expeditionary Units).

March with what were now labeled "mishap free flight hours" totaling 36,000. This was quickly followed by notification that -531 had been selected for the 1989 Chief of Naval Operations Safety Award.<sup>138</sup>

The squadron then redeployed to El Toro on 10 April. In spite of the usual high turnover in personnel following a WestPac deployment, as soon as it arrived, it was ordered to participate in a MAG-11 "minimum notice" readiness exercise. The next months saw a wide range of training missions, including preparations for nuclear, biological, and chemical threats. In May, one pilot, Captain Russell M. Smith, was chosen to attend the "Top Gun" class at NAS Miramar for a month.

There were close air support missions with the 1st Marine Division at Twentynine Palms in June, as well as a detachment sent to test a new radar at Luke AFB in Arizona. The month concluded with the arrival of a new commanding officer on 29 June, Lieutenant Colonel Keith J. "Shadow" Stalder.

In August, during a joint deployment with VMFA-121 at NAS Fallon, Nevada, the dramatic news was flashed that Iraq had invaded Kuwait. Speculation about the U.S. reaction was rampant. As Stalder later wrote:

*LtCol Keith J. Stalder enjoys a smile with Maj Wendy A. Smith, aircraft maintenance officer of Marine Aviation Weapons and Tactics Squadron 1 in Yuma.*

Photo courtesy of LtCol Keith J. Stalder, USMC



I expected and hoped that we would go to war, but I knew that we would need more airplanes to do it. After a few days, the decision was made to deploy MAG-11, but -531 and -121 would remain behind because we were not combat ready for airplanes. Needless to say, we were all very unhappy. To add insult to injury, we then became the donor of airplanes, people, parts, tools, and everything else for the squadrons that were going to the Gulf. We all knew it was the right thing to do, but it hurt to see everything going out the door piecemeal when we couldn't go ourselves. I went to Colonel Reitsch (MAG-11 Commander) and Colonel Forney (Assistant Wing Commander, 3d MAW), and begged them to take us to the war. The decision was above even their pay grade, and we were stuck in the U.S. while others went to the Gulf.<sup>139</sup>

It was a very difficult time for the Ghosts. All they could do was keep training and hope. With only three to four aircraft, Stalder sadly noted that "with 25 pilots it was tough to stay minimally safe, let alone ready to go to the Gulf, but we tried as hard as we could."<sup>140</sup>

Slowly, however, the squadron started to rebuild, and this led to a productive deployment to MCAS Yuma in October. During that fall, Stalder recalled that he "mounted a campaign to go WestPac. The -323 [a sister VMFA squadron] had been there well over the six months 'normal' tour, and it needed to be replaced. I hoped we'd get to the war from Iwakuni, and I knew that we'd just keep being stripped if we stayed in El Toro. There was good support for this by MAG-11 and 3d MAW, and we began to plan a deployment to Iwakuni for February 1991 with six aircraft (that was still all we could get)."<sup>141</sup>

Again it appeared that the squadron's hopes were fruitless when it had to contribute a new wave of men, parts, and equipment in December to units in the Gulf. Morale sank; WestPac looked like it would never materialize. But the situation brightened at the end of 1990, and January 1991 saw a concerted effort to prepare for a long-awaited TransPac deployment. A key part of this was qualifying for refueling from the KC135 tankers that would be used.

With -531's chronic shortage of planes, the solution was to fly six out and then pick up seven



Photo courtesy of 1st Lt Wesley Johnson, USMC

*LtCol Keith J. Stalder, LCpl Lorrise Soderquist, the squadron's newest Marine, and retired LtGen Keith Smith, former VMFA-531 pilot and its oldest alumnus, retire the squadron's colors.*

more from -323 as it left Iwakuni to return to El Toro. Both the commanding officer and all hands in -531 were "very happy to get out of El Toro" with the lurking hope that being brought up to strength and being overseas might lead to assignment to the Gulf War. On 10 February, the Ghosts passed the 40,000 mark in "mishap free flight hours." Congratulations and praise came from Major General Royal N. Moore, Jr., Commanding

General, 3d MAW, from his command post at Jubail, Saudi Arabia.<sup>142</sup>

At long last, on 13 February, the six remaining planes of VMFA-531 flew off for Iwakuni, the Ghosts' third WestPac deployment in three years. As part of MAG-12, 1st MAW, it was barely settled when it went back to Cubi Point for a two-month training stint. This encompassed air-to-ground firing, electronic warfare, DACT, and CAS missions.



Photo courtesy of Maj William Henson, USMC

*The squadron named El Toro, its long-time home, "Ghost Town."*

After its return to Iwakuni on 26 April, the DACT continued, this time against planes of the Japanese Air Self Defense Force. After only a month, the Ghosts moved again (25-26 May) to NAF Kadena for air-to-air gunnery practice, air-to-air intercept training, and more close air support missions. June saw the sought-after certification of some squadron pilots as "air combat training instructors."

The Ghosts thought they had seen everything in the long, eventful history of -531, but they had never experienced anything like the event of 12 June. On that day Mount Pinatubo erupted in the Philippines and buried much of Cubi Point under two feet of volcanic rock and ash. This stranded two squadron aircraft and a small detachment of men. Their following labors were monumental. Almost every hangar and building on the flight line, except for the one housing the two Hornets,

had collapsed, crushing whatever aircraft occupied them. The Marines of VMFA-531 kept a constant vigil, shoveling off roofs, digging a path to the runway, and completing the required maintenance to get the F/A-18s out of Cubi. Within two weeks the Ghosts were free. For their superior performance in the Philippines, the squadron was included in the award of a Meritorious Unit Commendation to Marine Air-Ground Task Force 4-90.\*

More DACT against USAF F-15 flights was the focus in early July, along with KC-135 tanker qualifications. Then came a move back to Iwakuni on the 14th, with preparations for a return to the United States. On 8 August, most of the -531 personnel left on a civilian airliner (called a "main

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\*See Appendix F for citation.

body movement"), and then on 15 August an unprecedented 16 F/A-18 aircraft of VMFA-531 flew out on what the pilots called "The Mother of all TransPacs."<sup>143</sup> They went with a personal communication from MAG-12 to Stalder which said:

Shadow: The performance of the "Grey Ghosts" of VMFA-531 while assigned to 1st MAW/MAG-12 was nothing less than outstanding. Without doubt, the Ghosts are the best fighter/attack squadron I have had the privilege to serve and fly with over the past year. . . . The Ghosts are truly exceptional. . . . You spent less time in Iwakuni than the law allows, and managed to do more than many squadrons in the past. . . . Shadow, you can be proud of the accomplishments of the Ghosts.<sup>144</sup>

#### *The Final Chapter*

Once safely back at El Toro, the life of the squadron for the remainder of 1991 was "more of the same": a strike at NAS Fallon, Nevada, DACT with F-14s, CAS at Twentynine Palms, and something new, with the quaint title of a "MAG-11 Bombing Derby."

Another milestone in safety came on 17 November, as -531 chalked up its eighth "mishap free" year. This brought a "Bravo Zulu" from the Commanding General, 3d MAW:

As you enter your 50th consecutive year of service to the fleet, your commitment to safety is evidenced by pride and professionalism. Over the past eight years your exceptional can-do attitude and outstanding operational readiness have resulted in 43,780 class-A mishap-free flight hours. During your most recent tour in WestPac, including an unprecedented 16 aircraft TransPac, you once again demonstrated your mettle: your world-wide reputation of professional excellence is well-deserved and is certainly evident in your outstanding safety record.<sup>145</sup>

This marked what would prove to be a final flourish for a squadron that had rung up a remarkable half-century record in a world war, three other wars, and cold war crises.

As the squadron resumed training in 1992 at El Toro, the budget cutters' axe loomed large over the Marine Corps. Sadly, it became necessary to

deactivate two squadrons, and VMFA-531 was one of them. The official message was typically sparse in its wording:

The term deactivation is defined to mean the elimination of personnel structure. Units were selected for deactivation based on squadron history, length of service, participation in campaigns and operations, honors, award citations, and deployment cycles. . . . On 31 March 1992 VMFA-333 and VMFA-531 will be deactivated. This action is required to meet FY92 end strength reductions.<sup>146</sup>

It was a crushing blow. Stalder spoke for everyone in the squadron when he said: "The decision to deactivate the Ghosts hit us all hard, to say the least. I tried unsuccessfully to have the decision reversed, but the politics would not permit it."<sup>147</sup>

Deactivation was a complex process—a procedure for which none of the Ghosts were prepared. January 1992 marked the beginning of a concentrated effort by Stalder to obtain good future assignments for all the personnel of his squadron. This was not easy: "It seemed as though everyone in MAG-11 wanted a piece of -531 to fill a hole they had."<sup>148</sup> However, with the help of the commanding officer of MAG-11, the Ghosts were able to focus on training as many pilots as possible to qualify as air combat tactics instructors. Thus, they would have the best qualifications for their next duty post.

The process of winding down was painful. There were "aircraft transfers on 12 February, and one by one Marines checked out. . . . By the end of the month the squadron was down to eight pilots, eight aircraft, and less than 50 percent of the enlisted troop strength."<sup>149</sup>

The accomplishments of -531 were glowingly summarized by a formal resolution of the State of California. It spelled out highlights of the long history of the squadron and concluded "VMFA-531 has built a record of achievement, readiness, and esprit that is second to none."<sup>150</sup>

Then the end came. On 27 March 1992, there was an emotional deactivation ceremony at "Ghost Town," El Toro. "This is sad to see," said Staff Sergeant Doran Scott, intelligence chief for VMFA-531. "It's sad to see 50 years just go away. We just got back from a successful overseas tour. No one was prepared for this."<sup>151</sup>

The squadron had finished off with 45,000

hours and more than eight years of mishap-free flight. It was the only squadron in the Marine Corps to have had 50 years of continuous service successively in night fighter, all-weather fighter, and fighter attack missions. Its standard bore streamers for a Presidential Unit Citation, a Navy Unit Commendation, two Meritorious Unit Commendations, and a number of campaigns. Following a narration of Ghost history, there were

remarks by the senior Ghost alumnus, Lieutenant General Keith A. Smith, and the final squadron commander, Lieutenant Colonel Keith J. Stalder. Then the colors were retired, marking the end of one of the Marine Corps' most storied squadrons.

On 31 March came the final act. Stalder flew out the last F/A-18A to Point Mugu, California, and it was all over. The long-time home for the Ghosts had truly become "Ghost Town."

# Notes

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## *Facing the Problem*

The principal primary source materials used in preparation of this history are held by the History and Museums Division, Headquarters U.S. Marine Corps, Washington, D. C., hereafter Hist&MusDiv, and can be seen at the Marine Corps Historical Center (MCHC), Building 58, Washington Navy Yard, Washington, D.C. Records of personal interviews conducted by Col Quilter for this history are in his possession. Unless otherwise noted, all quotations are from the squadron War Diary, Historical Report, or Command Chronology, as appropriate.

1. CMC (DivAvn) ltr AA-303mj to Maj F.H. Schwable, Subj: (missing), 31Jan42 (in possession of BGen Schwable).

## *1942: Getting Started— Washington and Cherry Point*

Unless otherwise noted, the material in this section is taken from an unpublished manuscript by Maj William W. Moore, USMC, "Under the Cover of Darkness: A History of the First Marine Night Fighter Squadron in World War II," 1981, located at MCHC, Washington, D.C., hereafter Moore ms.

2. CNO ltr OP-12F-DRC/ (SC) A21-1 to All Bureaus and Offices of the Navy Department, Subj: 27,500 Plane Program—Further Allocation of Airplanes, 28Mar42. Quoted in Moore ms.
3. CMC ltr AA 365-pmk to CNO, Subj: Night Fighters, Marine Corps, 12Jun42. Quoted in Moore ms.
4. BuAer Endorsement Aer-PL-23-IJE over VF, KV of CMC ltr AA 365-pmk to CMC, I 3Ju142. Quoted in Moore ms.
5. Vice CNO ltr OP-40-A-KB over (SC) A21-2 to CMC, Subj: Night Fighter Squadrons, Authorization of, 25Ju142. Quoted in Moore ms.

6. Maj F.H. Schwable memo to Director of Aviation, HQMC, Subj: Organization of the First VMF Night Fighter Squadron, 27Ju142.
7. BGen Frank H. Schwable, Transcript of intvw (OralHistColl, MCHC) Hist&MusDiv, HQMC, 18/25Apr80.
8. BGen Homer G. Hutchinson, Jr., untranscribed taped intvw with Col Quilter and Benis Frank, 10Oct86 (OralHistColl, MCHC).
9. LtCol F. H. Schwable ltr A4-3/ A3-1(1) to CMC, Subj: Commissioning Date VMF(N)-531 Request for Advancement, 24Oct42. Quoted in Moore ms.
10. CMC (Adjutant and Inspector) ltr AD-288-rs over 07J 31042 to LtCol F. H. Schwable, Subj: Commissioning Date of VMF(N)-531, 6Nov42. Quoted in Moore ms.
11. CO VMF(N)-531 msg to CMC 161345Nov42. Quoted in Moore ms.

## *Growing Pains at Cherry Point*

Most of the material in this section comes from an unofficial command diary called the "Squadron Log" kept by LtCol Schwable from 16Nov42 until 1Ju143. From 1Aug43 onward, the principal source is the VMF(N)-531 War Diary stored in Box 51, Accession No. 64A-3731 in the National Archives, Washington, D.C. Unless otherwise noted, all quotations to 1Ju143 are from the Schwable Command Diary and after 1Aug43 from the War Diary. The principal oral sources were interviews by Col Quilter of BGen Frank H. Schwable, USMC (Ret) on 14Oct86 and 18-19Jan87 and BGen John D. Harshberger, USMC (Ret), on 31Dec86, hereafter Schwable intvw and Harshberger intvw.

12. BGen H.G. Hutchinson telcon to Col Quilter on 16Oct86.
13. Gordon Swanborough and Peter M. Bowers, *United States Naval Aircraft Since 1911* (New York: Funk and Wagnalls, 1968), pp. 69-70.
14. Robert Sherrod, *History of Marine Corps*

*Aviation in World War II* (Washington: Combat Forces Press, 1952), p. 160, hereafter Sherrod, *Marine Corps Aviation in WWII*.

15. 1stSgt James L. Sankey intvw with Col Quilter, 19Nov43. Sankey served from private first class to sergeant as a turret gunner with the squadron Jan43-Oct44.

16. Sherrod, *Marine Corps Aviation in WWII*, pp. 447, 473-474.

17. Ibid, p. 162.

18 CO VMF(N)-531ltr to CG MarFAirWest, Subj: Report of Readiness, Forward Echelon, 30Ju143 (in WarD file).

### *To the Solomons and War*

Primary sources for this section are the War Diary and interviews. Other sources include the files of Fighter Command, Commander for Air, Solomons (Task Unit 33.1.3) located in Box 59, Accession 64A-3731, at the National Archives. Secondary sources for the Solomons campaigns include Sherrod, *Marine Corps Aviation in World War II*, Henry I. Shaw and Douglas T . Kane, *The Isolation of Rabaul* (Washington: HistBr, G-3 Div, HQMC, 1963), and W.F. Craven and J.L. Cate, eds., *The Army Air Forces in World War II—The Pacific: Guadalcanal to Saipan Aug42-Ju144*, vol IV (Washington: Office of Air Force History, reprinted 1983).

19. BGen Frank H. Schwable intvw w/Benis Frank, 18Apr80, pp. 112-114 (OralHistColl, MCHC).

20. Sherrod, *Marine Corps Aviation in WWII*, pp. 170-174.

21. CinCPacFlt ltr Pac-62-cd/AT-1 Serial: 3655 to SecNav, Subj: Night Fighter Squadron Seventy Five, Availability for publicity purposes, 2Jun44. Copy provided by Operational Archives Branch, Naval Historical Center, Washington, D.C.

22. Harshberger intvw.

23. CO VMF(N)-531 to CMC, 25Nov43.

24. CO VMF(N)-531 ltr to CMC, Subj: Report of Marine Night Fighter Squadron Operations in the South Pacific, 25Feb44 (in WarD file).

25. War Diary, 3-4Dec43.

26. ComAirSols OPLAN 1-144 para (3) (c), 28Jan44, delineates FtrCmd's night fighter mission. Located in Box 65, Accession 64A-3731, National Archives, Washington, D.C.

27. CinCPacFlt ltr Pac-62-cd/ AT -1 Serial: 3655 to SecNav, Subj: Night Fighter Squadron Seventy

Five, Availability for publicity purposes, 2Jun44. Copy provided by Operational Archives Branch, Navy Historical Center, Washington, D.C.

28. 12Jan44 Action Report.

### *February 1944 Climax*

29. Harshberger intvw.

30. ACA-1 #10, 16Feb44.

31. ACA-1 #11, 16Feb44, and LtCol Jack Plunkett intvw with/Col Quilter, 23Jun87.

32. On 18Dec44 SecNav in ltr 44-1421 initiated a Strike Flight Air Medal/Distinguished Flying Cross award system to conform with the USAAF, which had been resented by the comparatively much less decorated USMC flyers. In this system, an Air Medal was awarded for each five missions and a DFC every twentieth mission. On 18Apr46, CinCPac in ALPAC/126 made these awards retroactive to 7Dec41. Based on this Schwable was additionally awarded 10 Air Medals and three Gold Stars in lieu of an additional DFC in 1946 for his combat flights.

33. Schwable intvw.

34. Ibid.

35. Comments in ACA-1 #12

36. ACA-1 #13, 2-3Mar44.

37. ACA-1 #14, 13Mar44.

38. Harshberger's Aviators Flight Log Book.

39. ACA-1 #15, 10-11May44.

40. Sgt John Barna ltr to MCHC, 12Dec90.

41. Intelligence Div, SoPacFor, U.S. Pacific Fleet, Combat Experiences of VMF(N)-531, 28Apr44, based on report by Col F. H. Schwable (Bx 181 2B42, Personal Papers Coll, MCHC, Washington, D.C.).

### *Tigercats in Texas and China*

Primary sources for this section are the War Diary.

42. Henry I. Shaw, Jr., *United States Marines in North China, 1945 -1949*, (Washington: HistBr, G-3 Div, HQMC, rev. 1962), pp. 4-20.

43. Capt W.E. Scarborough, USN (Ret), *Tigercat in Action* (Carrollton TX: Squadron Signal, 1986), pp. 19-43. MTSGt (non.) Schoenberger, MAG-53, USMC, Group Operations Memorandum No.49-1946, (MCAS Cherry Point NC: 18Sep46), in MAG-53 War Diary file. Also Capt E.S. Holmberg intvw with Col Quilter, 13Nov89, and Maj T.H. Ullom intvw with Col Quilter, 7 Apr87.

### *Postwar Survival at Cherry Point*

Primary sources for this section are the War Diary and semi-annual Historical Reports for VMF(N)-531 and its parent groups MAG-53 and MAG-24. Historical Reports succeeded the War Diaries in 1946.

44. Sherrod, *Marine Corps Aviation in WWII*, pp. 422, 434.
45. Col Paul A. Noel memo to Capt John C. Chapin, 18May98.
46. BuAer, USN, Pilot's Handbook of Operating Instructions for Navy Models of F6F-3, F6F-3N, F6F-5, F6F-5N Airplanes AN 01-85FB-1, (Washington: 1Jun44)
47. Sample abbreviated GCA talkdown recreated by Col Quilter, using NavAer, Navy Pilots Information File NavAer 00-80T-33, (Washington: Jun49), para 5-2, pp. 9-10. Official "average" GCA minimums were given as "100 foot ceiling and 1/2 mile visibility."
48. LtCol R.O. Bisson ltr to CG AirFMFLant, Subj: Rpt of Formal Night Intercept Exercise, 7Aug47 (in War Diary/HistRpt file).
49. *531 Grey Ghosts*, Marine Corps Aviation Assoc., *Ghost Lore*, 1995-6 Vol., Issue No.3, p. 6.
50. Steve Ginter, *Douglas F3D Skyknight, Naval Fighters No.4* (Simi Valley, CA: Ginter, 1982), pp. 2-3.
51. CO VMF(N)-531 ltr to CO MAG 11, Subj: Second Task Fleet, Rpt of, 19Mar48 (in HistRpt file).
52. CG AirFMFLant ltr to CO VMF(N)-531, quoted in HistRpt for 1Jan50-30Jun50.
53. Quoted in HistRpt for 1Jan50-30Jun50.
54. Accident board quoted in HistRpt for 1Jan50-30Jun50.
55. DAF, USAF HistDiv, *United States Air Force Operations in the Korean Conflict*, 1Nov50-30Jun52, USAF Historical Study No.72 (Maxwell AFB AL: Air University, 1Jul55), pp. 58-59.
56. Maj T.H. Ullom intvw with Col Quilter, 26Sep87.

### *Enter the Jets: The Skyknight*

Primary sources for this section are the squadron's semi-annual Historical Reports, which end in 1954 when the requirement for such reports terminated. These are supplemented by interviews and articles from MCAS Cherry Point's base newspaper, *The Windsock*, microfilm copies of

which are located in the archives at MCHC. Dates are taken from flight crew logbooks and the Unit Muster Roll. Squadron records before 1950 are in the National Archives, and subsequently are in the National Records Center in Suitland, MD, with the more recent ones at the MCHC.

57. BuAer, USN, Pilot's Handbook, Navy Model F3D-2 Aircraft (AN 01-40FAB-1), 1 Dec54.
58. DAF, USAF HistDiv, *United States Air Force Operations*, p. 80.
59. Quoted in HistRpt for 1Ju152-31Dec52.
60. "Accelerated Carrier Suitability Tests," 13Feb52, quoted by Ginter, *Douglas F3D Skyknight*, pp. 13-14.
61. Quoted in HistRpt for 1Ju153-31Dec53.
62. BuAer, USN, Pilot's Handbook, Navy Model F3D-2 Aircraft, pp. 65-72.
63. Col L.P. Hart intvw with Col Quilter, 11Oct86. Maj Hart was operations officer of the squadron in 1953.
64. USAF/Air Defense Command, *A Chronology of Air Defense 1914-1961* (ADC Historical Study No.19), (Historical Division, Office of Information, HQ, ADC, nd.), p. 36.

### *Skyrays to WestPac*

No Historical Reports or Command Chronologies exist, nor were they required during this period. Events were reconstructed from *The Windsock* articles, interviews, and the "cruise books" which were produced by the squadron for the two Skyray WestPac deployments. Dates are taken from the Unit Diary and pilots' logbooks.

65. LtCol Gordon E. Gray intvw with Col Quilter, 2Jan88.
66. NAVWEPS, USN, *Flight Handbook, Navy Model F4D-I Aircraft* (NAVWEPS 01-40-FBA- 1, Washington: 1Nov57), hereafter NAVWEPS, *Flight Handbook, F4D-I*.
67. Capt G.G. O'Rourke, USN (Ret), "The F4D 'Ford': A Better Idea?", *U.S. Naval Institute Proceedings*, (Jun86), p. 124. See also the F4D's designer's reply in *Proceedings* (Feb87) p. 80.
68. USAF / Air Defense Command, *A Chronology of Air Defense 1914-1961*, p. 54.
69. NAVWEPS, *Flight Handbook, F4D-I*, Section 1.
70. BGen Henry W. Hise intvw with Col Quilter, 11Oct86, and ltr to Col Quilter, 12Oct86.
71. CG AirFMFLant ltr to CMC (Code AAJ), Subj: Deployment of Marine All-Weather Fighter

- Squadron 531, 12Dec58.
72. NAVWEPS, *Flight Handbook, F4D-I*, Section 1.
  73. Col Emmons S. Maloney intvw with Col Quilter, 24Sep87.
  74. Maj E.M. Oster, quoted by Col J.M. Verdi in ltr to Col Quilter, 18Oct86.
  75. Capt D.C. Escalera (ed.), *Marine All-Weather Fighter Squadron 531* (1960-62 Cruise Book).
  76. MajGen William B. Fleming intvw with Col Quilter, 25Nov89.

#### *Phantom and MiGs Over the Florida Straits*

77. LtGen Keith A. Smith intvw with Col Quilter, 21Jan87.
78. *The Windsock*, 14Sep62.
79. LtCol Robert F. Foxworth intvw with Col Quilter, 11Oct86.
80. Ronald T. Pretty (ed.), *Jane's Weapon Systems 1977* (London: Jane's, 1977), p. 169.
81. Smith intvw. Limitations from *CNO, NATOPS Flight Manual, Navy Model F-4B Aircraft* (NAVAIR 01-245FDB-1, Washington: 1Nov66). Both Mach and airspeed limits were rather easily exceeded in this configuration.
82. Maj Robert J. Divoky intvw with Col Quilter, 3Dec89.
83. LtCol Ray L. Hanle intvw with Col Quilter, 30Nov89; Capt Frank H. Schwarz, Jr., intvw with Col Quilter, 17Jan88; and Maj Robert J. Divoky intvw with Col Quilter, 2Dec89. Quotes are from Schwarz'.
84. "Next Time Shoot, JFK Says," *Miami Herald*, 22Feb63
85. MajGen Michael P. Sullivan intvw with Col Quilter, 30Dec87; Capt Charles C. Taylor intvw with Col Quilter, 13Jan88.
86. Hanle intvw.
87. LtCol Orey E. Cory ltr to MCHC, 20Jan91.
88. Hanle and Taylor intvws.
89. 1stLt Wesley D. Johnson ltr to MCHC, 9Jan91.

#### *Phantoms to WestPac*

90. Capt G.F.R. Hanke, ed., *VMFA-531 1964-1965: Far East Cruise* (Daito, Tokyo, 1965), p.1.
91. "VMFA-531 Returns from Carrier Training," *The Windsock*, 3Apr64.
92. *CNO, NATOPS Flight Manual, Navy Model F-4B Aircraft*, pp. 3: 31-35.
93. CG 3d MAW ltr to CMC (Code A03E), Subj: 3d MAW Special Report 302-64 (U), 6Aug64. Located in Classified Files, MCHC.
94. Hanke, p. 50.
95. Smith intvw. The photograph hung in the bar of the MCAS El Toro Officers' Club for more than 20 years.
96. Hanke intvw. Quotes are Hanke's.
97. This near-disaster led to a full-scale interchange of formal correspondence between McGraw, as commanding officer of -531, and higher echelons. At issue was the squadron standard practice of taking off with flaps up or "no flaps," while other echelons felt that "half flaps" were mandatory. Hanle, supra, and critical view by Col John M. Verdi, comments on draft ms, 7Jan91 (Comment File, MCHC, Washington, D.C.).
98. Hanke and Schwarz intvws.

#### *Combat in Vietnam*

Primary sources for this section are the VMFA-531 Daily Summaries and Mission Debriefing messages located in the Command Chronology file at MCHC, augmented by interviews. Quotes are from the former two unless otherwise noted. Secondary sources include Jack Shulimson and Major Charles M. Johnson, USMC, *U.S. Marines in Vietnam: The Landing and The Buildup, 1965* (Washington: Hist&MusDiv, HQMC, 1978); for Marine Corps activities, Air War Study Group, Cornell University, *The Air War in Indochina* (Rev. Ed), Raphael Littauer and Norman Uphoff, eds.; and Stanley Kamow, *Vietnam: A History* (New York: Viking, 1983) for an overview.

99. CG 1st MAW msg to VMFA-531 (and others) Subj: VMFA-531 Deployment, 0432Z 12Apr65 (In ComdC files, MCHC, Washington, D.C.).
100. Shulimson and Johnson, p. 23.
101. LtGen Keith B. McCutcheon, "Marine Aviation in Vietnam, 1962-1970," *U.S. Naval Institute Proceedings*, May71, p. 126. "First to fight" remark by the then CinCPac J-3, BG Homer G. Hutchinson, Jr. intvw with Col Quilter, 18Jan90. Fontana remark in ComdC files.
102. VMFA-531 Summary for Period 13-30 Apr11965 (in ComdC file).
103. IR Rep No.1 (12)/65/158 TW 12 IR #176/B12 dtd 17May65 is given as the source of this BDA in the Strike Results report.
104. BLT4 msg to VMFA-531 (and others), dtd 150110ZMay65 (in ComdC file).
105. "D" Co, 3d ReconBn ltr to CO VMFA-531, Subj: Air Support on 14May65, 19May65 (in ComdC file). Visits and messages like these were

great morale boosters for the Ghosts and other aviation Marines who rarely got to meet the people they supported.

106. BLT4 msg to CG 3d MarDiv, info VMFA-531, 180856ZMay65 (in ComdC file).

107. CG 3d MarDiv to VMFA-531 (and others), Subj: Air Support, 290620ZMay65 (in ComdC file).

108. Statement of LtCol N.G. Ewers, nd, attached to Strike Results msg for 27May65 (in ComdC file).

#### *Cherry Point Again: Rebuilding and Training*

Primary sources for this section were the Command Chronology file which began coverage on 1Dec66 and continues to the present. Other sources were the MCAS Cherry Point *The Windsock* base newspaper and Col Quilter's experiences as a pilot with VMFA-531 in 1966.

109. "531 Colors Return to Wing From Viet Nam," *The Windsock*, 23Jul65, p. 1.

110. HQMC, DC/S Air, Marine Corps Aviation Training and Readiness Manual, MCO P3800 series.

#### *Rebirth and Renaissance at El Toro*

Main references are the ComdC and the sources below. Col Quilter served as operations officer and pilot/aircrew training officer in the squadron in 1968-69.

111. John S. Attinello, Weapons System Evaluation Group, Air-to-Air Encounters in Southeast Asia: Red Baron Reports (Vol. 1), WSEG Report #116, DTIC Report #125 (Alexandria, VA, Defense Technical Information Center, Oct67). Also NavAirSysCom, Report of Air-to-Air Missile System Capability, Review, Jul-Nov68: Ault Report (Washington D.C., 1969). In Naval Fighter Weapons School library, NAS Miramar, California.

112. MCO P3800 (T&R Manual) series for 1968 op cit. The F-4 syllabus was written by Capt John D. Cummings and Col Quilter who deliberately selected innocuous names such as "Basic Aircraft Maneuvering" and "Fighter Intercepts" for various ACM flights to get around any possible reluctance at reintroducing such flying on the part of senior officers. The terms were still in use in 1990.

113. Col John L. Thatcher, comments on draft ms, 14Jan91 (Comment File, MCHC).

114. Cubic Defense Systems, TACTS/ ACMI/MDS (San Diego, CA, 1988). ACMI (Air Combat Man-

euvering Instrumentation) was the USAF term for TACTS.

115. See Robert L. Shaw, *Fighter Combat: Tactic and Maneuvering* (Wellingborough, GB: Patrick Stephens, 1986), pp. 346-383, for the evolution of visual identification.

116. Thatcher.

#### *To the Mediterranean on the Forrestal*

117. InVMFA-531ComdCfile.

118. LtCol David G. Vest intvw with Col Quilter, 3Mar70; Col David V. Denton intvw with Col Quilter ca. early 1990; and Col Randolph H. Brinkley intvw with Col Quilter, 13Jan88.

#### *El Toro Home Interlude*

119. LtCol David G. Vest intvw with Col Quilter, 3Mar70.

120. In VMFA-531 ComdC file.

121. Col Randolph H. Brinkley intvw with Col Quilter, 13Jan88.

122. Col John A. Gagen intvw with Col Quilter, 7Mar90.

123. 531 Gray Ghosts Squadron, *Ghost Lore*, 1994-5 vol., no.2, pp. 4-5.

#### *The Indian Ocean on the Coral Sea*

In addition to the Command Chronology , the framework for this section is drawn from Capt Paul B. Ryan, USN (Ret), *The Iranian Rescue Mission: Why It Failed* (Annapolis: Naval Institute Press, 1985), Col Gerald R. Pitzl, *A History of Marine Fighter Attack Squadron 323* (Washington: HQMC, Hist&MusDiv, 1987), and interviews with Col Gary R. Braun, Maj J. F. Flock, and Capt Eugene S. Holmberg.

124. *Ghost Lore*.

125. Col Gary R. Braun intvw with Col Quilter, 8Mar90.

126. Braun intvw.

127. Quoted in Capt Paul B. Ryan, USN (Ret), *The Iranian Rescue Mission: Why It Failed* (Annapolis: Naval Institute Press, 1985), p. 61.

128. *Ghost Lore*, supra.

#### *El Toro Again: Enter the Hornets*

129. CG 3d MAW msg to MAG-11, 292221ZNov82, Subj: End of an Era (in ComdC file).

130. CO VMFA-531ltr to CG 3d MAW, Subj: Bright Star 85 MAG-11(-) Rein After Action Report, 26Aug85 (in ComdC file).
131. Col Manfred A. Rietsch intvw with Col Quilter, 19Jan88.
132. Secretary of the Navy Letter of Commendation to VMFA-531 (Rein), nd., Rec'd 12May87 (in ComdC file).
133. Gunnery procedure from LtCol H.G. Hutchinson III intvw with Col Quilter, 1Apr90, and LtCol J.A. Gallinetti intvw with Col Quilter, 1Apr90. Statistics from MAG-11 draft msg to CG 3d MAW, nd, ca. 7Dec85 (in ComdC file).
134. CO VMFA-531ltr to CG 3d MAW, Subj: Green Flag 86-3 After Action Report, dtd 19Mar86 (in ComdC file).
135. LtCol J.L. Cieslak intvw with Col Quilter, 29Mar90. Quote is from CO VMFA-531 ltr to CG 3dMAW, Subj: Tyndall AFB FL Deployment After Action Report, 2Apr86 (in ComdC file).
136. Cieslak intvw. .

*Back to WestPac*

This section and the one following are based on the VMFA-531 ComdC files for Jan-Jun90 and Jan91-Mar92. (The ComdC for Jul90-Dec90 is missing.) Also helpful are issues of the *Flight Jacket* and LtCol Keith J. Stalder ltr to Capt John C. Chapin, 13Aug98.

137. ComSeventhFlt msg to VMFA-531, 21Mar90; VMFA-531 ComdC, 1Jan-30Jun90, item 11.
138. CNO msg to CG FMFPac, 23Mar90, in Item 14 includes VMFA-531, citing "keen attention to detail, dedication, superb leadership. ..standard bearers of excellence."
139. Stalder ltr.
140. Ibid.
141. Ibid.
142. CG 3d MAW msg to VMFA-531, 24Apr91, citing "highest caliber professional performance . . . can-do attitude and exceptional operational readiness." (In VMFA-531 ComdC, 1Jan91-30Jun91, item 3.)
143. VMFA-531 ComdC, 1Jul-31Dec91, enc11, p. 4.
144. MAG-12 msg LtCol Keith J. Stalder, dtd 30Aug91, ComdC, supra, item 5.

*The Final Chapter*

145. MajGen Harold W. Blot, CG 3d MAW, msg to LtCol Keith J. Stalder, 5Dec91; VMFA-531 ComdC, item 7.
146. CMC msg to CG FMFPac, para 4B, 22Jan92.
147. Stalder ltr.
148. Ibid.
149. VMFA-531 ComdC, 1Jan -31Mar92 , sec. 2, p. 4.
150. Ibid., item 7.
151. *Flight Jacket*, 3Apr92, p. 16.

# Appendix A

## Marine Night Fighting - 1944

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While on leave in 1944, Colonel Schwable took time to reflect on lessons learned in a long letter with copies to virtually everyone in the naval aviation community with an interest in the night fighting problem.\* In it Schwable noted:

- The importance of GCI [ground controlled intercept] unit landing in the initial stages of an assault, such as done at Green Island, "breaking up the only two enemy attacks" on its first night of operation with two shoot downs.
- The improvement of the shipborne FDOs [Fighter Director Officers] once they had been made aware of the specific problems of night fighters; to wit, Lieutenant Reg Dupuy's controlling of the victories. Major Hicks in turn had been educated in ships' problems with tight spaces, although the question of [the defensive] effectiveness [of] AA [antiaircraft] versus night fighters remained open.
- A recommendation for a dedicated "fighter direction ship."
- The value of experience on all levels—pilots, aircrew, and GCI—to make night fighting effective, February [1944] being a dramatic example. Conversely, an inexperienced GCI controller could lose the whole tactical situation by "mike fright." One had actually placed the fighter ahead of the bogey by failing to pass all the "bogey dope" available.
- Problems of critical spares; parts backordered for three months had failed to arrive, and "only through [the] misfortune of one Navy PV squadron [has] this squadron been able to salvage sufficient spare parts to continue . . . operations."
- The ideal night fighter must be a twin engine . . . two seater, high performance air-plane . . . "Strangely enough, there has been a greater loss

of contacts due to the PV's inability to slow down, to climb, or to turn sharply, than from a lack of speed."

- The advantage of a turret in spotting the bogey and engaging more than one enemy at a time.
- Piecemeal deployment to combat; only eight months after initial departure was the "complete, though untrained unit . . . of 19 pilots, 21 ground officers and 352 men" reunited in the Pacific.
- Vacillating policies on AA versus night fighters when in pursuit of a "hard contact"; more specifically, the unit's experienced "night fighter pilots [could] judge more accurately than ground personnel which type of opposition is most effective."
- The vulnerability of the PV if "caught out in" daylight compared to the F4U-2, "one of [its] few advantages."
- A series of pithy "Hints to Pilots" which included pressing one's face against a spotless windscreens for better visual tracking; "relaxing" while flying on instruments to avoid fatigue; keeping general track of one's whereabouts during chases; careful visual stalking of the bogey with RO reading off ranges, and not "los[ing] him under the PV's big nose" to a "100 percent no deflection shot" at the fuselage, then at the engine if necessary; pressing the gun firing button—"not some other button"—of well-bore sighted guns "in close [to] shoot him down and get the hell out of the way" to avoid being struck by debris; and if the pilot cannot get a shot at maneuvering bogey, then "waste no time in telling your turret gunner to let loose with everything he has."

In the forwarding endorsement the Commander, Air Force, Pacific Fleet recognized an urgent need for at least two types of night fighters: "(a) One suitable for carrier based operations" and "(b) Another desired for shore based operations"—thus articulating a debate which would continue for 20 years or more.

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\*CO VMF(N)-531 ltr to CMC, Subj: Rpt of VMF(N)-531 Operations in the South Pacific, 25Nov43-25Feb44, dtd 25Feb44 (in War Diary).

## Appendix B

# Marine Close Air Support - 1965

The ground-based forward air controller (FAC)—usually an aviator or, later, a Naval Flight Officer as well—consulted with his ground commander and requested air support through a Direct Air Support Center (DASC). The DASC was usually co-located with the Fire Support Coordination Center (FSCC) for ease in integrating other supporting arms. These requests were monitored by higher commands, such as battalion, regiment, or division, using silence as consent. This eliminated passing requests up and down the chain of command. A more time-consuming system was used if the request came from the 2d Air Division.\*

The DASC then relayed the request to the Tactical Air Direction Center (TADC) which scrambled the flight via hotline. The lead RIO answered the telephone, verified a scramble, and then copied the TACAN coordinates of the target or marshal point, plus the frequency and call sign of the FAC. Meanwhile, the others raced (or rapidly waddled)—as fast as their 50 pounds of harness, “G”-suit, and survival gear permitted—to their aircraft, yelling: “Scramble!” The line crew fired up the jet air starter unit as the aircrews buckled into their Phantoms, which had been pre-flighted and run up earlier. Using abbreviated scramble procedures, a section could be armed and airborne within 10 minutes if two air starters were available, or about 15 minutes if there was only one.

Once airborne, the flight checked in with the TADC, the DASC, and the FAC, the latter two often using the same radio frequency. It was clear at this point that small ground targets were almost impossible to pick up from a fast moving jet. Thus, most close air support (CAS) in the Republic of Vietnam was controlled from Cessna

O-1E spotter planes, or UH-1E Huey helicopters, which used white phosphorous (“Willie Pete”) 2.75 inch rockets to mark the target. Ground FACs could and did control as well, often lobbing out smoke grenades to mark positions. Because Marine jets unaccountably were only equipped with ultra high frequency radio, and not with very high frequency which the ground forces used, the FAC had to have both. He briefed the CAS planes on target location, elevation, direction of run and pull-off, plus location of friendlies. If the CAS were really close—down to within 50-60 feet of friendly positions—the FAC would withhold “clearance hot” until he was sure the attacking plane was aligned on target.

Now it was up to the Ghost crew. In fair weather, an 8,000-foot roll-in altitude was used to achieve a 30 degree dive. The RIO called out speeds, altitudes, and dive angles, as the pilot struggled with his tracking run to bring his pipper onto the target just in time for “Standby . . . Mark!” Release came at 3,000 feet, followed by a four “G” pull-out. With lower ceilings or in poor visibility, the F-4B was flown in a 2-4 “G” turn—often in afterburner to sustain energy—while the pilot fought to keep the target in sight and bring his Phantom into the proper attack “slot or “groove.” Sometimes he lost it in a cloud or mist, and had to go on instruments briefly until breaking out again, a nerve-wracking business in the mountains or at night. Sweat soaked each crewman’s fire-retardant cotton flight suit throughout and literally poured off them in high “G” maneuvers.

But nothing would push aircrews harder to take more chances than the knowledge that fellow Marines on the ground were in trouble and needed their help.

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\*The coordination of air support between USAF, Army and ARVN units was difficult at best, and was complicated by language and doctrinal problems. Close air support *per se* was not practiced by the USAF at this time, and it preferred to use pre-planned strikes with 20 or more hours lead time.

# Appendix C

## Commanding Officers

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LtCol Frank H. Schwable .....	16 Nov 1942 - 31 Mar 1943
Maj John D. Harshberger .....	.1 Apr 1943 - 31 May 1943
Col Frank H. Schwable .....	.1 Jun 1943 - 17 Feb 1944
LtCol John D. Harshberger .....	.18 Feb 1944 - 6 May 1944
Capt James H. Wehmer .....	.7 May 1944 - 31 Aug 1944
Capt Ralph J. Garza .....	.1 Sep 1944 - 3 Sep 1944

SQUADRON DISBANDED 3 SEP 1944; REFORMED 13 OCT 1944

LtCol Radford C. West .....	.13 Oct 1944 - 10 Nov 1944
Maj Edward V. Mendenhall, Jr. ....	.11 Nov 1944 - 16 Nov 1944
Capt Robert R. Finch .....	.17 Nov 1944 - 15 Mar 1945
Maj Alfred N. Gordon .....	.16 Mar 1945 - 9 Apr 1945
Maj Robert P. Keller .....	.10 Apr 1945 - 10 Jun 1945
Capt James H. Wehmer .....	.11 Jun 1945 - 21 Oct 1945
LtCol Alfred N. Gordon .....	.22 Oct 1945 - 27 Dec 1945
Maj Harold G. Schlendering .....	.28 Dec 1945 - 6 Jun 1946
Maj Joseph H. Reinburg .....	.7 Jun 1946 - 16 Jul 1946
Maj Ernest R. Hemingway .....	.17 Jul 1946 - 31 Jul 1946
Maj Joseph H. Reinburg .....	.1 Aug 1946 - 31 May 1947
LtCol Peter D. Lambrecht .....	.1 Jun 1947 - 31 Jul 1947
LtCol Andrew G. Smith, Jr. ....	.1 Aug 1947 - 14 Jul 1948
LtCol Nathan T. Post, Jr. ....	.15 Jul 1948 - 12 Jun 1949
LtCol Joseph W. Kean, Jr. ....	.13 Jun 1949 - 15 Jun 1950
LtCol John R. Spooner .....	.16 Jun 1950 - 23 Jul 1951
Maj Fred J. Gilhuly .....	.24 Jul 1951 - 28 Jul 1951
LtCol Boyd C. McElhany, Jr. ....	.29 Jul 1951 - 6 Jan 1952
LtCol Gelon H. Doswell .....	.7 Jan 1952 - 11 Feb 1952
Maj Lowell D. Grow .....	.12 Feb 1952 - 14 Jun 1953
Maj Arthur R. Boag .....	.15 Jun 1953 - 30 Jul 1953
LtCol Ernest R. Hemingway .....	.31 Jul 1953 - 14 Jun 1954
LtCol Roscoe C. Cline, Jr. ....	.15 Jun 1954 - 31 Aug 1954
LtCol Alexander M. Hearn .....	.1 Sep 1954 - 10 Nov 1955
LtCol Walter W. Turner .....	.11 Nov 1955 - 31 Jul 1956
LtCol Donald S. Bush .....	.1 Aug 1956 - 31 Jul 1957
Maj Earl W. Johnson .....	.1 Aug 1957 - 19 Aug 1957
LtCol Gordon E. Gray .....	.20 Aug 1957 - 31 Jul 1958
LtCol Henry W. Hise .....	.1 Aug 1958 - 29 Jun 1960
Maj Emmons S. Maloney (temporary) .....	.30 Jun 1960 - 5 Jul 1960
LtCol George J. Collins .....	.6 Jul 1960 - 2 May 1961
LtCol John N. Swartley .....	.3 May 1961 - 1 Jul 1961
LtCol George J. Collins .....	.2 Jul 1961 - 4 Jul 1962
LtCol Robert F. Foxworth .....	.5 Jul 1962 - 1 Jul 1963

LtCol William C. McGraw, Jr.	.2 Jul 1963 - 1 Jul 1965
LtCol Robert L. Wildey	.2 Jul 1965 - 4 May 1966
Maj Frank D. Topley	.5 May 1966 - 15 Dec 1966
Maj Roy A. Seaver	.16 Dec 1966 - 14 Jul 1967
LtCol William K. Parcell	.15 Jul 1967 - 31 Mar 1968
Maj Karl A. Zimmerman	.1 Apr 1968 - 25 Jul 1968
LtCol Richard Perez	.26 Jul 1968 - 24 Jul 1969
LtCol John L. Thatcher	.25 Jul 1969 - 23 Feb 1971
LtCol Robert N. Hutchinson	.24 Feb 1971 - 12 Oct 1971
LtCol John T. Zych, Jr.	.13 Oct 1971 - 25 Jul 1973
LtCol Michael P. Cady	.26 Jul 1973 - 26 Aug 1974

SQUADRON DEACTIVATED 10 JUN 1975; REACTIVATED 29 AUG 1975

LtCol John A. Gagen	.27 Aug 1974 - 24 Jun 1976
LtCol David G. Vest	.25 Jun 1976 - 8 Jun 1978
LtCol John A. Williams	.9 Jun 1978 - 30 May 1979
LtCol Gary R. Braun	.31 May 1979 - 10 Dec 1980
LtCol John L. Vogt	.11 Dec 1980 - 17 Dec 1981
LtCol Robert R. Renier	.18 Dec 1981 - 9 Jul 1982
LtCol James L. Lucas	.10 Jul 1982 - 15 Jun 1984
LtCol Manfred A. Rietsch	.16 Jun 1984 - 25 Jun 1986
LtCol James L. Cieslak	.26 Jun 1986 - 27 Oct 1988
LtCol John F. Goodman	.28 Oct 1988 - 28 Jun 1990
LtCol Keith J. Stalder	.29 Jun 1990 - 31 Mar 1992

SQUADRON DEACTIVATED 31 MAR 1992

# Appendix D

## Chronology

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16 Nov 1942	Activated at Cherry Point, North Carolina, as Marine Night Fighter Squadron 531
Apr 1943	Assigned to MAG-53, 3d Marine Aircraft Wing
Jul 1943	El Centro, California
Aug 1944	Territory of Hawaii
Sep 1943	Reassigned to MAG-21, 1st Marine Aircraft Wing
1944	Espirito Santo, New Hebrides Islands
1944	Russell Islands, Solomon Islands
1944	Vella Lavella, Solomon Islands
1944	Bougainville, Solomon Islands
Aug 1944	Relocated to Cherry Point, North Carolina
3 Sep 1944	Deactivated
13 Oct 1944	Reactivated at Kinston, NC, and assigned to MAG-53, 9th Marine Aircraft Wing
29 Nov 1944	Relocated to Eagle Mountain Lake, Texas
Feb 1946	Relocated to Cherry Point, North Carolina
Mar 1946	Reassigned to the 2d Marine Aircraft Wing
Dec 1946	Detached from the 2d Marine Aircraft Wing
Jun 1947	Detached from MAG-53
Oct 1947	Assigned to the 2d Marine Aircraft Wing
Jun 1948	Assigned to MAG-14
14 Oct 1948	Redesignated as Marine All Weather Fighter Squadron 531
Sep 1949	Reassigned to MAG-24
Apr 1959	Deployed to Atsugi, Japan, and assigned to MAG-11, 1st Marine Aircraft Wing
Jan 1960	Redeployed to Cubi Point, Philippines
1960	Pingtung, Taiwan
1960	Atsugi, Japan
Jun 1960	Relocated to Cherry Point, North Carolina, and assigned to MAG-24, 2d Marine Aircraft Wing
Jul 1961	Redeployed to Astugi, Japan, and reassigned to MAG-11, 1st Marine Aircraft Wing
Jul 1962	Relocated to Cherry Point, North Carolina, and reassigned to MAG-24, 2d Marine Aircraft Wing
Feb 1963	Relocated to Key West, Florida, for Cuban Missile Crisis
Jun 1963	Returned to Cherry Point, North Carolina
1 Aug 1963	Redesignated as Marine Fighter Attack Fighter Squadron 531
Jun 1964	Deployed to Atsugi, Japan, and reassigned to MAG-11, 1st Marine Aircraft Wing
Apr 1965	Redeployed to Da Nang, Republic of Vietnam
Jul 1965	Relocated to Cherry Point, North Carolina, and reassigned to MAG-24, 2d Marine Aircraft Wing
Apr 1968	Relocated to El Toro, California, and reassigned to MAG-33, 3d Marine Aircraft Wing
Dec 1970	Reassigned to MAG-13
Sep 1971	Reassigned to MAG-11
May 1972	Deployed to the Mediterranean with the Sixth Fleet on board the <i>Forrestal</i> (CVA 59), and reassigned to Commander, Attack Carrier Wing 14

Jul 1973	Relocated to El Toro, California, and reassigned to MAG-11, 3d Marine Aircraft Wing
1 Jul 1975	Cadre status; administratively attached to MAG-32 at MCAS Beaufort, South Carolina
9 Aug 1975	Reactivated at MCAS El Toro, California, and reassigned to MAG-11
Nov 1979	Deployed to the Western Pacific/Indian Ocean with the Seventh Fleet on board the <i>Coral Sea</i> (CV 43), and reassigned to Commander, Carrier Wing 14
Apr 1980	Participation in Combat Air Patrol contingencies in the Arabian Sea during the Iranian hostage rescue mission
Jun 1980	Returned to El Toro, California, and reassigned to MAG-11
Dec 1981	Operations on board <i>Ranger</i> (CV 61)
24 Nov 1982	Transferred last F-4N
29 May 1983	First F/A-18 Hornet delivered to Ghost Town
28 Aug 1983	F/A-18 transition complete.
Sep 1983	First fleet F/A-18 pilots attend Top Gun, both are Grey Ghosts
22 Mar 1984	First F/A-18 TransPac and missile "shoot on arrival" at Kaneohe Bay, Hawaii
16 Jul 1985	Deployment to Inshas Air Base, Egypt, in support of Operation Bright Star
26 Jun 1986	Deployment to NAS Adak, Alaska, in support of Exercise Sand Dollar
12 May 1987	Squadron received a Letter of Commendation from the Secretary of the Navy for its participation in Bright Star
Jul 1987	Former Grey Ghost Captain Andrew M. Allen (1983-1986) became the 14th Marine to be selected by NASA as an astronaut
17 Aug 1987	VMFA-531 becomes the first fleet F/A18 squadron to drop MK-20 Rockeye
25 Apr 1988	12 F/A-18s arrive at "The Chon," Yechon Air Base, Republic of Korea, as part of the UDP
Jul 1988	Deployment to U-Tapao, Kingdom of Thailand, as part of the Air Combat Element of Cobra Gold-88
8 Oct 1988	Grey Ghosts return to El Toro
3 Oct 1989	12 F/A-18s deploy to Iwakuni, Japan, as part of the UDP
Oct 1989	Conducted real world intercept and escort of Soviet aircraft during Valiant Blitz-90
16 Feb 1990	VMFA-531 becomes the first Marine F/A18 squadron to deploy MK-52 sea mines in a tactical environment
Mar 1990	Conducted real world intercept and escort of Soviet aircraft during Team Spirit-90
Apr 1990	12 F/A-18s redeploy to El Toro, California
Feb 1991	VMFA-531 deployed to Iwakuni, Japan, as part of the UDP and in support of Operations Desert Shield and Desert Storm
Jun 1991	Two Grey Ghost aircraft trapped at NAS Cubi Point, Republic of the Philippines after Mt. Pinatubo erupts
Aug 1991	16 F/A-18s return to E; Toro, California
31 Mar 1992	VMFA-531 is deactivated by order of the Commandant of the Marine Corps

Note: While the active-duty Grey Ghost squadron is no more, in 1979 the "531 Gray (sic) Ghost Squadron" was born as a chartered squadron of the Marine Corps Aviation Association. (The active duty squadron spells Grey Ghosts as opposed to Gray Ghost for the MCAA chartered squadron.) Worldwide in scope, the squadron is an independent entity adhering to the concepts and principles of the MCAA. Membership is open to all personnel who at one time or another were attached to -531 and are interested in carrying on the spirit of comradeship traditional among those who have served in Marine Aviation, and especially the Grey Ghosts of -531. A newsletter, the *Ghost Lore*, is published periodically. In addition, the Composite Crew of the Year Award was inaugurated in 1980 for active duty Ghosts in -531. There is also a Marine Night Fighter Association which has alumni of -531 as members.

## Appendix E

## Honors

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PRESIDENTIAL UNIT CITATION STREAMER  
(Vietnam, 11 May - 15 Jun 1965)

NAVY UNIT COMMENDATION STREAMER  
(Vietnam, 10 Apr - 15 Jun 1965)

MERITORIOUS UNIT COMMENDATION STREAMER WITH ONE BRONZE STAR  
(12 Apr 1979 - 1 May 1980)

ASIATIC-PACIFIC CAMPAIGN STREAMER WITH FOUR BRONZE STARS  
(New Georgia Operation, 11Sep - 16 Oct 1943)  
(Treasury-Bougainville Operation, 27 Oct - 15 Dec 1943)  
(Bismarck Archipelago Operation, 16 Dec - 1 May 1944)  
(Solomon Islands, 13 May - 9 Aug 1944)

AMERICAN CAMPAIGN STREAMER  
(North Carolina & Texas, 13 Oct 1944 - 2 Mar 1946)

WORLD WAR II VICTORY STREAMER  
(16 Nov 1942 - 3 Sep 1944, 13 Oct 1944 - 31 Dec 1946)

NATIONAL DEFENSE SERVICE STREAMER WITH TWO BRONZE STARS  
(27 JAN 1950 - 27 JUL 1954)  
(1 Jan 1961 - 15 Aug 1974)  
(2 Aug 1990 - 31 Mar 1992)

MARINE CORPS EXPEDITIONARY STREAMER  
(Indian Ocean, Nov 1979 - Jun 1980)

VIETNAM SERVICE STREAMER WITH ONE BRONZE STAR  
(Vientam Defense Campaign, 10 Apr - 11 Jun 1965)

VIETNAM CROSS OF GALLANTRY WITH PALM STREAMER  
(10 Apr - 11 Jun 1965)

## Appendix F

# Citations

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The President of the United States takes pleasure in presenting the PRESIDENTIAL UNIT CITATION to the

### FIRST MARINE AIRCRAFT WING

for service as set forth in the following

#### CITATION:

For extraordinary heroism and outstanding performance of duty in action against the North Vietnamese Army and Viet Cong forces in the Republic of Vietnam from 11 May 1965 to 15 September 1967. Throughout this period, the First Marine Aircraft Wing, operating in I and II Corps tactical zones of the Republic of Vietnam, North Vietnam, and adjacent waters, sought out and destroyed determined enemy forces and provided combat air support to ground forces of the Free World and the Republic of Vietnam. Participating in 195 major operations, and thousands of other attacks, the Wing continuously and aggressively carried the battle to the elusive enemy in bitterly contested actions. Operations such as DOUBLE EAGLE, HARVEST MOON, STARLITE, HASTINGS, PRAIRIE, UNION, HICKORY, COCHISE, and SWIFT reflect the high degree of superior airmanship, valor, devotion to duty, and professionalism exhibited by personnel of the Wing.

Although heavily committed to increased combat operations, the Wing developed and successfully employed new weapons, tactics, and procedures against the hard-core communist forces with gratifying results. Through the aggressive actions of the Wing, military and political victories were denied the insurgent Communist forces, thereby providing a more stable atmosphere for the legally constituted Government of the Republic of Vietnam.

The establishment and logistical support of many separate airfields throughout the I Corps tactical zone and the vital air supply support provided the III Marine Amphibious Force and its allied ground forces, was a tribute to the resourcefulness and determination of the Wing. This dependable support was provided under the most trying and difficult combat conditions. Flying in fair weather and foul, against a fanatical, well-armed enemy, the uncommon courage and intrepidity of the Marine pilots and supporting Wing personnel, acting in a concerted team effort, contributed to another glorious chapter in an already illustrious history. The valor, devotion to duty, aggressive spirit, professionalism, and ingenuity of the entire First Marine Aircraft Wing in battle against a well trained, dangerous, and determined enemy reflected the highest degree of heroism and exemplary performance, and were in keeping with the highest traditions of the Marine Corps and the United States Naval Service.

LYNDON B. JOHNSON

The Secretary of the Navy takes pleasure in presenting the NAVY UNIT COMMENDATION to

MARINE FIGHTER/ATTACK SQUADRON  
FIVE HUNDRED THIRTY-ONE

for service as set forth in the following

CITATION:

For exceptionally meritorious service from 10 April to 15 June 1965, while participating in combat operations in the Republic of Vietnam. Arriving at Da Nang Air Base, Republic of Vietnam on 10 April 1965, Marine Fighter/Attack Squadron FIVE HUNDRED THIRTY-ONE was the first Marine fixed-wing squadron to conduct combat air operations in support of Marine units and Republic of Vietnam (RVN) forces against Communist insurgents in Vietnam. The squadron became the first fixed-wing unit in aviation history to provide fully integrated en route escort and landing zone support for rotary-wing aircraft in tactical combat operations. The squadron performed outstandingly in these missions, in its maintenance efforts, and in its ability to provide air-to-ground support for a broad spectrum of missions.

A remarkable record of aircraft availability and reliability was achieved despite diversion of a large amount of manpower to construct a tent camp, maintain a ground defense force, and prepare earthworks and fighting positions for its defense force and tent camp. While its aircrews were trained primarily for air-to-air missions, the squadron's superb overall readiness and aggressiveness compensated for a lack of training for certain tasks. The performance of Marine Fighter/Attack Squadron FIVE HUNDRED THIRTY-ONE in support of TU LUC-150, a major RVN-Viet Cong battle waged from 31 May to 4 June 1965, was instrumental in stopping a major Viet Cong offensive in Quang Ngai Province. The courage, professional competence and devotion to duty displayed by the officers and men of Marine Fighter/Attack Squadron FIVE HUNDRED THIRTY-ONE were in keeping with the highest traditions of the Marine Corps and the United States Naval Service.

All personnel attached to and serving with Marine Fighter/Attack Squadron FIVE HUNDRED THIRTY-ONE during the above period, or any part thereof, are hereby authorized to wear the NAVY UNIT COMMENDATION Ribbon.

PAUL R. IGNATIUS  
Secretary of the Navy

The Secretary of the Navy takes pleasure in commending

MARINE FIGHTER ATTACK SQUADRON 531 (REINFORCED)

for service as set forth in the following

CITATION:

For meritorious service in connection with Exercise BRIGHT STAR 85 from 1 August 1985 to 16 August 1985. During this period, Marine Fighter Attack Squadron 531 (Reinforced) and its supporting units meticulously prepared for and flawlessly executed the first long range, land based F/A-18 squadron deployment in conjunction with a multinational, multi-service strategic reinforcement exercise sponsored by the United States Command in the Middle East. Working in a harsh, bare base desert environment, the Squadron operated its ten aircraft, flying demanding and complex air-to-air and ground attack missions in support of I Marine Amphibious Force Marines and USS NIMITZ (CVN 68) strike forces.

During the eleven-day operation in the Egyptian desert, the Squadron maintained a 96 percent full mission capable aircraft rate and operationally flew every aircraft every day. The Squadron displayed to all commands involved in the exercise, the reliability, force projection, and sparse logistic requirements that a Marine F/A-18 aviation unit can provide to any potential battlefield throughout the world. By their continuous display of professionalism, determination, and loyal devotion to duty, the officers and enlisted personnel of Marine Fighter Attack Squadron 531 (Reinforced) reflected credit upon themselves and upheld the highest traditions of the Marine Corps and the United States Naval Service.

JOHN LEHMAN  
Secretary of the Navy

The Secretary of the Navy takes pleasure in presenting the MERITORIOUS UNIT COMMENDATION to

USS *CORAL SEA* (CV 43)  
AND  
EMBARKED CARRIER AIR WING FOURTEEN

for service as set forth in the following

CITATION:

For meritorious service during an extensive, eleven-month overhaul, an intensive pre-deployment workup, and an extended deployment to the Western Pacific and Indian Ocean from 7 March 1978 to 1 May 1980, and from 12 April 1979 to 1 May 1980 for participating embarked units. USS *Coral Sea*'s overhaul was characterized by superb planning and involvement by ships personnel. All work packages were completed on time, new standards of excellence in workmanship and quality control were established, culminating in a most successful sea trial. During a compressed workup cycle made difficult by numerous schedule perturbations, the ship and crew responded with exemplary spirit and sense of purpose resulting in *Coral Sea* and embarked Carrier Air Wing FOURTEEN being superbly conditioned and ready in every aspect for deployment to the Western Pacific.

Throughout deployment, *Coral Sea* demonstrated the capability to maintain an effective military presence in an area of vital importance to the nation's security. Further, during deployment to the Indian Ocean from 31 January to 1 May 1980, *Coral Sea* responded to the challenge of supporting contingency plans to rescue the American Hostages in Iran by resourceful development and flawless execution of tactics which ensured the successful initiation of this mission. By their continuous display of professionalism, determination, bold courage, and total devotion to duty, the officers, enlisted personnel, and civilian employees of USS *Coral Sea* (CV 43) reflected credit upon themselves and upheld the highest traditions of the United States Naval Service.

EDWARD HIDALGO  
Secretary of the Navy

The Secretary of the Navy takes pleasure in presenting the MERITORIOUS UNIT COMMENDATION to

MARINE AIR-GROUND TASK FORCE (MAGTF) 4-90  
UNITED STATES MARINE CORPS

for services as set forth in the following

CITATION:

For meritorious service from 1 April 1990 to 31 July 1991. Marine Air-Ground Task Force (MAGTF) 4-90 distinguished itself by maintaining a demanding training program while simultaneously responding to crisis missions in support of Commander, United States Naval Forces, Philippines (COMUS-NAVPHIL); Joint Task Force, Philippines; and U.S. Embassy. In July 1990, MAGTF provided critical humanitarian aid to earthquake victims, and in September furnished relief assistance in the wake of numerous destructive typhoons, and in June 1991, performed daring rescue efforts following the catastrophic eruption of MOUNT PINATUBO.

Thousands of tons of supplies were moved and hundreds of stricken Philippine Nationals were evacuated to safety. The MAGTF rapidly and effectively responded to Navy, Marine, and Air Force aircraft incidents by providing MAGTF tactical recovery of aircraft and personnel packages, salvaging essential equipment, and providing security for aircraft and aircrew. The MAGTF excelled in Exercises ELIGIBLE RECEIVER, BEARING GUARD, and BALIKATAN, as well as numerous no-notice drills and field evolutions associated with threats to the security of United States facilities and installations. By their superior accomplishments, "can do" spirit, and untiring devotion to duty, the officers and enlisted personnel of Marine Air-Ground Task Force (MAGTF) 4-90 reflected credit upon themselves and upheld the highest traditions of the Marine Corps and the United States Naval Service.

JOHN H. DALTON  
Secretary of the Navy

The Commandant of the Marine Corps takes pleasure in presenting the ROBERT M. HANSON AWARD to

MARINE FIGHTER ATTACK SQUADRON FIVE THREE ONE

for outstanding performance as a Fighter squadron for the period 1 July 1977 through 30 June 1978 as set forth in the following

CITATION:

In quest of the elusive title of "Best Marine Fighter Squadron" Marine Fighter Attack Squadron Five Three One (VMF A-531) began this period by establishing high goals for material readiness, aircrew training, efficiency, mobility and esprit de corps. Through readiness exercises, missile shoots, and operations such as Red Flag, the "Grey Ghosts" of VMFA-531 maintained one of the highest F-4 Operationally Ready/Full Systems Capable rates in Naval Aviation including 100% on 1 June 1978 when 51 sorties were launched utilizing all 11 aircraft.

Developing tactics, flying low-level radar navigation routes and participating in weapons systems evaluations all contributed to an active and productive aircrew training environment that produced some of the Marine Corps' finest fighter crews. A 99% successfully released drop rate for more than 5,000 pieces of air to ground ordnance typifies the efficiency with which this squadron operated. To test the squadron's mobility, VMFA-531 conducted each deployment as a tactical maneuver which provided an effective inspection criterion by which the squadron could painlessly assess their own capability in this area. The result is a well-trained, well-equipped, and well-organized fighter squadron that can be justifiably proud of bearing the title "Marine Fighter Squadron of the Year."

LOUIS H. WILSON  
GENERAL, USMC  
Commandant of the Marine Corps

# Appendix G

## Squadron Aircraft

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DESIGNATION	MANUFACTURER	IN SQUADRON
SNJ-4 Texan	North American	16 Nov 42
SB2A-4 Buccaneer	Brewster	21 Dec 42
SNC-1 Falcon	Curtiss	Jan 43
PV-1 Ventura	Lockheed	15 Feb 43
SBD-5/6 Dauntless	Douglas	13 Jan 45
SB2C-4E Helldiver	Curtiss	Jan 45
F7F-1N/2N/3N Tigercat	Grumman	17 Jan 45
F6F-5N Hellcat	Grumman	May 47
F3D Skyknight	Douglas	Feb 52
F4D Skyray	Douglas	Feb 58
F-4B/N Phantom II	McDonnell Douglas	16 Nov 62-24 Nov 82
F/A-18A Hornet	McDonnell Douglas	29 May 83-31 Mar 92

## Appendix H

# Squadron Insignia

The insignia of the Grey Ghosts was designed in January 1944 by Captain B. Colby, USMCR, one of the original members of VMF(N)-531. It depicts flashing rays from the eye hollows of a skull, symbolizing a secret locating device (Radar) used by the first Marine night fighters.

In its earlier years, the squadron carried an "LT" marking on its tail. Then came "EC" Echo Charlie, sometimes in combination with the skull and rays, which continued to the end of the squadron's life. The members of -531 were proud to be referred to as "Ghosts" and called their long-time base at El Toro "Ghost Town."



Earlier version for VMF(AW)-531



Final version for VMFA-531



Unofficial insignia used after acquiring the F/A-18 Hornet



The "alumni" in the Marine Corps Aviation Association

*The squadron insignia of VMFA-531 is shown on the back cover. For a detailed history of the insignia and other illustrations see Appendix H.*

